The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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THE CHEMICAL AGE offices are closed on Saturdays in accordance with the adoption of the five-day week by Benn Brothers, Limited

VOL. XLI. NO. 1,063 — November 11, 1939 — Annual Subscription, 21s. Overseas, 26s.

The Supply of Scientific Apparatus

BEHIND the letter contributed to our columns this week by Mr. Norman Sheldon there is a curious story of officialdom which causes one to wonder how far it is true that "History is the chart and compass for national endeavour." It is but a short 25 years since this country found itself entering the greatest war in history handicapped by the circumstance that the whole supply of scientific glassware and porcelain used by the country had been derived from the enemy and that there was no one in all Britain prepared to manufacture it. To be sure, we did not in those days think very much of chemists or scientific men; they were only just beginning to come into their own. The first German War, however, revealed the extreme importance of the chemist, the physicist, the biologist, *et hoc genus omne*, and likewise demonstrated that these men could not work without tools. Industry, the Government services, and the medical services were all gravely hampered by the non-existence of a home supply of scientific glassware and porcelain. Several firms, acting under official prompting, managed to obtain skilled key men from abroad, erected the necessary plant and equipment, and trained local men to develop the industry. The older generation of chemists will have painful recollections of some of the earlier efforts made to produce the necessary articles in this country; they will also have an even livelier remembrance of the wonderful way in which difficulties had been surmounted by the end of the war, so that in some directions we were actually ahead of those who had supplied us before the war.

The Government of that day learnt the lesson that home production in essential chemicals and scientific apparatus must be encouraged, and shortly after the war the Safeguarding of Industries Act gave tariff protection to a number of small but important key industries such as Scientific Glassware, Optical Glassware, Fine Chemicals and Laboratory Porcelain. It was not long before the foreigner made a determined attempt to regain his pre-war position, and sent goods to this country at prices against which we could not compete, despite a $33\frac{1}{3}$ per cent. tariff protection. As a consequence many firms closed down, and the others reduced their range of manufactures. The German and Czech factories regained their pre-war markets largely in this country and almost wholly in other countries. It was a fundamental mistake that we did not encourage the foreigner to buy more of these products from us; the moral which we failed to learn from history is that it is impossible to have a really strong industry based on home demand only; it is necessary to export also if the industry is to grow to a sufficient size to cater for all British needs. In that respect the scientific glassware industry resembles the chemical plant industry. It will hardly be credited, but the fact remains that in spite of the urgent necessity for fostering our home industry in these goods, Government departments, including those directly concerned with the production of war materials, have consistently purchased the bulk of their laboratory ware from abroad. That, however, as chemical plant makers know, is typical of the mentality of Government departments; the British manufacturer receives only the slightest encouragement, but is expected to produce whatever is needed out of his hat immediately foreign supplies are cut off. The result of this policy has been that this country is again facing a shortage of scientific laboratory ware of many kinds.

Mr. Sheldon's complaint is not so much that we have not encouraged home production in the past, as that our military authorities have now further handicapped the industry by taking away key men. It is complained that the schedule of reserve occupations was drawn up without reference to those in the industry who knew whose work was vital and whose was not. The primary difficulty concerns the Territorial Army and men on the Reserve. If a man's occupation is reserved at under 25 years of age he may be earmarked for return to civil employment. If his occupation is reserved at 25 years or over he is retained in the Colours irrespective of age or occupation. In any event he cannot be released if above the rank of private without the long and cumbersome procedure of representations through a Government Contracting Department. It is inevitable that in so huge an undertaking as the conduct of a major war, difficulties in procedure must arise, especially in the early stages, but this matter was brought to the notice of the authorities as long ago as April last. It takes from 5 to 10 years to train a skilled glass-blower or tube-maker, 3 years to train a potter, and a year to train a kiln man. Another difficulty is that firms without direct Government contracts seems to be unable to get a hearing at all even though they have indirect contracts. The supply of scientific laboratory ware is of such fundamental importance that Mr. Sheldon and the firms with whom he is associated must be regarded as having made out a case for immediate investigation by the Minister of Supply in collaboration with the fighting services.

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NOTES AND COMMENTS

Aluminium in Switzerland

THOUGH mainly dependent on foreign countries for the majority of metallic raw materials, Switzerland has to-day developed the production of aluminium to a very important position in the world market. The Swiss aluminium industry, founded in 1888, very largely owes its rapid expansion to the exploitation of the almost unequalled supply of water-power which is available. Over and above the production of the metal itself, Swiss industry has developed an important manufacture of aluminium products, mainly for export, including part-manufactured articles of aluminium alloys, rolled and stamped aluminium ware, aluminium powder, etc. The four Swiss aluminium works are at Neuhausen, on the Rhine (the oldest), and three in the Rhône valley: Chippis, Martigny-Bourg, and Martigny-Ville, the last established only in 1938. The Chippis factory, opposite Sierre, is by far the largest, and many non-technical travellers in the Rhône valley consider that its buildings and its smoke are inappropriate to that lovely country. It draws power from the Rhône and several tributary streams, notably the Navizence, the harnessing of which is one of the most notable feats of modern hydraulic engineering. About 150 factories in Switzerland deal with the manufacture of aluminium, and in 1938 the industry employed 7,000 operatives, 3,000 in the preparation of the metal and 4,000 in manufacturing its products, while 24,000 tons of the unmanufactured metal and 7,900 tons of manufactured articles were exported.

September Trade

TRADE in September was affected very considerably, as was to be expected, by the onset of war conditions, according to a recent article in *The Board of Trade Journal*. The prime cause was, no doubt, the uncertainty and dislocation caused by the change-over from peace to war conditions. The requisitioning of vessels for the Expeditionary Force, the institution of the convoy system, the diversion of shipping from non-essential to essential trades, and the special difficulties of trade with the Scandinavian countries were all contributing factors. The immediate institution of machinery for controlling certain exports, comparable with that which grew up gradually in the course of 1914-18, also affected various branches of export trade somewhat severely at the outset. It is noteworthy, however, that the reduction in exports in September as compared with a year earlier was relatively smaller than in August, 1914. Imports last month were valued at £49.9 million. The reduction compared with September, 1938, was £25.1 million, or 33 per cent. At the outbreak of the last war the fall in imports was rather less, the figures for August, 1913 and 1914, showing a fall from £56.0 million to £42.4 million, or 24 per cent.

Exports and Re-Exports

THE value of exports of United Kingdom goods in September, amounting to £23.1 million, was £16.7 million (42 per cent.) less than in September, 1938. These figures exclude Government stores sent abroad for His Majesty's Forces. The comparative figures for August, 1913 and 1914, were £44.1 million and £24.2 million, the reduction being 45 per cent. Re-exports showed a fall from £4.0 million to £2.4 million (41 per cent.), the reduction thus being about the same as for exports of United Kingdom goods. The excess of imports over exports of merchandise last month amounted to £24.5 million, as compared with £39.5 million in August and £31.1 million in September, 1938.

Methacrylate Resins

AMONG the newest and most interesting synthetic resins is the methacrylate group, described in a symposium in *Chemical Industries*, October, 1939. Their optical properties are superior to glass, and films of this material are harder than those made of any other synthetic resin. Liquid forms of these resins are available in two types—unpolymerised viscous syrups, and solutions of the resin in organic solvents. The unpolymerised forms, in which the chemical reaction has not yet been completed, are used to impregnate wood, cloth, wallboard, paper, electric coils, tile or stone. Polymerisation or completion of the chemical reaction then takes place within the materials, which find wide application especially in the electrical and food packaging industries. Can linings for beer, wine, vinegar, petrol, and dilute acids have been suggested as uses, as well as baking finishes where permanent high gloss and non-yellowing are desired. Numerous types of laminations may thus be made, as, for example, in the aircraft field and for lamp shades. The solutions of methacrylate resins are used for clear surface coatings, especially on non-ferrous metals such as aluminium, chromium, and brass; for undercoatings of difficult adhesion jobs; for impregnating paper and textiles; and in insulation. They may be brushed, sprayed, dipped and baked. The quick-drying clear film has an elasticity of 1,000 per cent. at room temperature and its light transmission lies between that of ordinary window glass and quartz. Baking is recommended for better gloss and adhesion, and a harder film.

Cancelled Celebrations

BECAUSE of the war the William Murdoch Memorial Committee has cancelled its plans to commemorate the centenary of the discoverer of gas for lighting. It is hoped, however, that the plans may be revived at a later date. Arrangements in Scotland to commemorate the centenary to be held in Glasgow have also been cancelled, and plans for the broadcast of a feature programme on Murdoch's life are likewise suspended.

HYDROGEN ION CONTROL IN WATER TREATMENT*

Tests in the Tugela River

THE importance of hydrogen ion control in water treatment is a comparatively recent development, its importance first being pointed out in 1921 by Wolman and Hannan[1]. Primarily it is used in the control of the clarification of turbid and coloured surface waters by the addition of coagulants such as alum, copperas (ferrous sulphate), etc. *p*H control can also be applied to sterilisation with chlorine or chloramine; to the softening processes; to the protection of pipe-lines; and in the case of feed and boiler water, in diminishing corrosion by the establishment of an "optimum" *p*H value. In the case of natural water the *p*H reaction is largely due to equilibria between free CO_2 and bicarbonate ions, kept in solution in conjunction with calcium and magnesium ions.

The following *p*H figures for different solutions of commercial water treatment chemicals in common use were recently determined in our laboratory and will throw light on the behaviour of these chemicals in water treatment:

	10%	0.4%	0.04%
Ferrous sulphate	3.0	3.8	—
Alumina ferric	2.0	3.2	—
Filter alum	2.8—3.0	—	—
Soda ash	11.6	11.6	11.6
Sodium aluminate	11.6	—	—
Caustic soda	12.0	12+	12+
Trisodium phosphate (crystalline)	12.0	12.0	12.0
Disodium phosphate (crystalline)	9.5	9.4	—
Monosodium phosphate (crystalline)	4.4	4.53	—
Sodium hexametaphosphate ("Calgon")	5.8	6.25	7.0
Lime water	Saturated solution over 12		

NOTE.—As will be seen later, there is a certain amount of doubt as regards *p*H determinations over 11.0 even by electrical methods.

There are two methods of measuring the *p*H value of a solution: the Colorimetric Method and the Electrometric Method. For ordinary routine testing of waters the colorimetric method is in general use, though the author has found that the results obtained are not always strictly accurate or reliable for reasons stated below. This method involves the employment of a range of organic indicators which change colour according to the *p*H of the liquid with which they are mixed. Each indicator has its own particular range and the colour obtained is compared with standard colour tubes. These standard solutions are contained in sealed tubes and contain a definite amount of indicator and a "buffer" solution of known *p*H (a "buffer" is the salt of a weak acid or base and is used to prevent the sharp change in *p*H values on addition of acid or alkali). It may be mentioned that there are no reliable colour standards for *p*H ranges above 10.0, one reason being the action of very high *p*H solutions on the glass container when kept for any length of time.

Devices for Colour Comparison

There are, of course, a large number of commercial colorimetric sets on the market, some with very ingenious devices for comparing the colour obtained during the test with standard colour tubes. A very rapid but rough *p*H test can be made by using a "compound" indicator, made up of a mixture of indicators. Such an indicator is the B.D.H. Universal Indicator, and, in the author's experience, gives rough and fairly reliable results over a wide range of 3-11. It keeps well and can be used for routine testing at power stations, but its use is limited to such rough tests. As mentioned above the author has found that colorimetric *p*H determinations are not always reliable for the following reasons:

(1) Deterioration of the indicator, i.e., errors introduced through dissociation of the indicator, thus supplying hydrogen ions to the test solution.

(2) Errors due to the action of a neutral salt, which may be present in the water, upon the colour change.

(3) Errors due to the effect of temperature upon indicator dissociation.

(4) Errors in comparing colour tints. No two operators will agree on the exact shade of colour produced, even when not affected by colour blindness.

(5) Cannot be used for highly coloured or very turbid waters.

Further, feed and condensate waters are often comparatively free from mineral salts and therefore practically "unbuffered." Colorimetric methods are, generally speaking, accurate enough for routine testing but accurate determinations can only be carried out by an electrometric method, taking special precautions to preserve the carbon dioxide equilibrium unchanged.

Electrometric *p*H Meters

There are a number of electrometric *p*H meters on the market, for example, the portable Beckmann *p*H meter, manufactured by the National Technical Laboratories, Pasadena. The primary elements are a "glass" quinhydrone electrode half filled with exactly decinormal hydrochloric acid, saturated with quinhydrone, and a "calomel" electrode of known potential filled with saturated potassium chloride containing mercury and calomel (mercurous chloride). There is a temperature regulator. Its use depends upon the fact that a small potential difference exists between an electrode and the liquid in which it is contact, the *p*H of the liquid determining the magnitude of this potential difference. In this instrument the very small E.M.F. produced is amplified by valves. Provided the instrument and the electrodes are kept clean and the instrument frequently checked against freshly made "buffer" solution of known *p*H the electrometric method of determining *p*H is exceedingly accurate and reliable for *p*H up to 10.0 or even 11.0 and has been used by the author in all detailed research. Electrometric methods can be used even with highly coloured or turbid waters unlike colorimetric methods.

At *p*H 10 or over an error is introduced through action of caustic alkali on the glass electrode. A series of correction curves for *p*H over 10 are therefore supplied with the instrument; *p*H measurements over 11 are not really reliable owing to the rapid absorption of CO_2 with alteration of *p*H.

For standard buffer *p*H solutions, the following are recommended as a result of long use:

(1) 9.5 grams C.P. borax in 500 mls. of *freshly boiled* distilled water. *p*H=9.24.

(2) 65 mls. of above solution and 35 mls. of exactly decinormal hydrochloric acid. *p*H=8.5.

(3) 57.5 mls. of borax solution and 42.5 mls. of the decinormal acid. *p*H=8.14.

(4) 55 mls. of borax solution and 45 mls. of the decinormal acid. *p*H=7.9.

These solutions keep well but should be renewed at frequent intervals.

There are now automatic electrical *p*H recorders which give a continuous record of *p*H of water, and can be made to automatically regulate the flow of alkalies from a chemical dosing tank. Such an apparatus is Kent Multelec *p*H Recorder and Chemical Dosing apparatus, which uses an antimony-calomel electrode.

The removal of suspended matter, colour and bacteria from surface water is accomplished by the addition of a "coagulant" such as alumina ferric, filter alum, or more rarely copperas (ferrous sulphate). As will be noted from

* Extracted from a paper by G. W. Bond, B.Sc., A.Inst.M.M., of the Electricity Supply Commission, published in the *Journal of the Chemical, Metallurgical and Mining Society of South Africa*, Vol. XL, No. 2.

the *p*H figures from 10 per cent. solutions given above, all three are acid salts. With certain types of water sodium aluminate is also used for clarification, either alone or in conjunction with alum, and it will be observed that this compound is highly alkaline. Now in the case of the alums, the aluminium radicle combines with alkali to form a bulky precipitate of aluminium hydroxide, which in settling out carries the colour, suspended matter and bacteria down with it. Experience has shown that efficient coagulation takes place at a definite *p*H known as the "optimum point" which varies for different waters but which is generally under 6.0. By determining this optimum *p*H value for a specific water, the smallest amount of alum or other coagulant necessary to give an efficient "floc" can be controlled so that no chemicals are wasted. As the result of extensive experiment the author has found the "optimum range" for the Tugela River water used at Colenso Power Station to be 5.5-5.9 for alum or alumina-ferric coagulation.

Coagulation with Ferrous Sulphate

To turn to coagulation with copperas (ferrous sulphate). This chemical was formerly much used as a clarifying agent but of recent years appears to have been superseded by alum or alumina-ferric on account of cost, though it is still sometimes used as an "internal coagulant" in boiler water, in view of the fact that ferrous hydroxide by conversion to ferric hydroxide rapidly absorbs residual oxgyen. Barker[2] states that with ferrous sulphate coagulation is not complete until a *p*H of about 9.0 is reached. Britton[3] also states that ferrous hydroxide is not completely precipitated until that figure is attained, but adds that its action depends on the ease with which it undergoes oxidation to ferric hydroxide by means of air. From experiments the author has carried out on the Tugela River water, it has been found that clarification begins at 6.8 and is complete at *p*H of 7.1. It would appear then that the figure given both by Barker and by Britton is far too high and applies apparently only when air is partly or wholly excluded during coagulation. It is obvious that unless the raw water has an initial high alkalinity, it is necessary, in coagulating with the acid copperas, to add alkai along with this coagulant, to elevate the *p*H to above 7.

In view of the fact that sodium aluminate is a highly alkaline compound it would at first sight appear that coagulation with the sodium compound is not possible. As is well known the qualitative separation of iron from aluminium is accomplished by adding to the mixed iron and aluminium hydroxides excess of caustic soda. The $Al(OH)_3$ is dissolved leaving the $Fe(OH)_3$. It must be borne in mind, however, that in sodium aluminate the aluminium is in the *negative* radicle unlike the alum in which the aluminium is in the *positive or basic radicle.*

$Al_2(SO_4)_3 \longrightarrow Al^{++} + SO_4''$ ions
(Aluminium sulphate)

$Na_2Al_2O_4 \longrightarrow Na^{+} + Al_2O_4''$ ions
(Sodium aluminate)

On account of this fact the reaction of sodium aluminate in clarification cannot be compared with alum.

In the case of alum it has been shown that aluminium hydroxide "floc" forms at a *p*H which differs for different waters but is generally well under 7.0 whereas in the case of sodium aluminate the optimum point is over 10.0 and in this case it is highly probable that complex calcium and magnesium alumino-silicates are formed and not aluminium hydroxide. Sodium aluminate has been tried out on the Tugela River water, so far with somewhat unsatisfactory results, due probably to the fact that during the rainy season when the river water is very turbid, the total hardness is under 3.0 parts while the magnesium hardness is negligible.

The following tests with regard to sodium aluminate on the same river water may be of interest. Three grains per gallon of sodium aluminate were added to the turbid river water with a *p*H of 7.5. This elevated the *p*H to 9.2 but no coagulation took place; caustic soda was added gradually until the *p*H was raised to 11.5 but no coagulation took place. This would appear to prove that it is not aluminium hydroxide which is formed wih sodium aluminate. Lime was substituted for caustic soda but no reaction took place until a *p*H of over 10 was attained; but the clarification in this case was not complete due probably to lack of magnesium in the river water. In this particular instance a calcium alumino-silicate appeared to be formed.

As regards the "basic-exchange or zeolite" process for water softening, it has been shown that the hydrogen ion concentration of brine used in regenerating zeolite is an important factor, while the *p*H of the water undergoing softening affects also zeolitic action. Sweeney and Riley[4] have shown that too high a *p*H above *p*H 7.8 leads to unsatisfactory results, while too low a *p*H has a solvent action on the zeolitic material.

As far as boiler and boiler feed waters are concerned the acids involved, which cause iron corrosion, are carbonic acid (carbon dioxide) and possibly hydrochloric derived from the hydrolysis of magnesium chloride.

(*a*) *Carbonic Acid.*

If waters contain dissolved CO_2 then corrosion can take place according to the following reactions:

$$Fe + CO_2 + H_2O \longrightarrow FeCO_3 + H_2$$
$$4FeCO_3 + O_2 + 10\,H_2O = 4\,Fe(OH)_3 + 4\,H_2O + 4\,CO_2 \text{ and}$$
$$2\,Fe(OH)_3 \longrightarrow Fe_2O_3 + 3\,H_2O$$

Thus carbon dioxide is regenerated and can thus do damage out of all proportion to its amount.

The decomposition of sodium carbonate into carbon dioxide and caustic soda, which takes place in high pressure boilers, is a source of carbon dioxide and may lead to corrosion of turbine blades at dew point and beyond. This may lead to an acid condensate, though it is true that most of the free gases in steam are removed in the condensers. The evaporation of raw waters containing bicarbonates or free CO_2 may be another source of CO_2 though here again most of the dissolved gases will be removed during condensation. The fact remains, however, that condensate water is frequently acid through dissolved CO_2.

To counteract the low *p*H of condensate through this cause, alkali must be added either in the form of lime or caustic soda or trisodium phosphate. The use of the former chemical may, however, lead to scale problems.

Magnesium Chloride Acidity

Another potential source of acidity in the boilers is magnesium chloride. This may be present in untreated water used as "make-up" or may be derived in the case of coastal power stations, evaporating all "make-up," from leakage of sea water used in the cooling system. Even in coastal stations where there is no appreciable condenser trouble, there is always a minute amount of sea water finding its way into the boilers.

Magnesium chloride can break down or "hydrolyse" in a boiler according to the reaction:

$$MgCl_2 + 2H_2O = Mg(OH)_2 + 2HCl$$

Ferric chloride is immediately formed by the action of the acid on iron and this in turn breaks down as follows:

$$FeCl_3 + 3H_2O = Fe(OH)_3 + 3HCl$$
$$2Fe(OH)_3 + \longrightarrow Fe_2O_3 + 3H_2O$$
(Rust)

Similarly with magnesium nitrate. It is thus necessary to add alkali to counteract the potential corrosiveness of sea water or waters rich in the nitrates and chlorides of magnesium.

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FELDSPAR AND BERYLLIUM IN AMERICA

Old Methods and New Developments

FELDSPAR mining in the United States has been notoriously wasteful, according to a recent report issued by the U.S. Bureau of Mines. Only coarsely crystallised deposits have been mined, usually only to shallow depth. Older mines are reopened again and again as the more accessible deposits are exhausted, but mining operations always have been highly selective, as only the richest parts of the pegmatite deposits have been mined. Fully half the feldspar in rock actually broken has been rejected on the mine dumps or at the grinding mills. In many districts much of the mining has been done by farmers and others in their spare time. Consequently hand methods (prodigally wasteful of human labour as well as of natural resources) have persisted. Often the spar is furnished at a much lower cost than would be possible if mined by more mechanised methods on a strictly commercial basis. Mechanisation hitherto has been confined principally to quarrying wider faces, compressed-air drilling, power-shovel loading, improved transportation or hoisting equipment, and screening and sorting. Hand loading, however, is more economical so long as the material has to be cobbed and sorted on the quarry floor.

Wasteful Practices

In some localities using these crude methods feldspar is still produced at low cost, but in the older districts it appears to be difficult to obtain clean spar at less than $5 or, in many cases, $6 or more a ton. These higher costs are no barrier to the expanding use of feldspar, but the upward trend in prices reveals the gradual exhaustion of higher-grade deposits that can be worked by existing wasteful methods. Consumers are demanding a better product, and to meet this demand many operators have found it convenient to blend the materials from different mines. Magnetic separation has been adopted at most grinding plants, but virtually the only improvement in milling is obtained through the differential grindability of associated minerals whereby much of the coarse mica may be separated.

The feldspars may be divided into two main groups: (1) Potash spar, orthoclase or microcline, and (2) plagioclase, isomorphous mixtures of albite and anorthite. Formerly potash spar was chiefly in demand, but the market for feldspars has been greatly broadened by their utilisation in glasses, glazes, and enamels, as well as in pottery and industrial porcelain. Although both feldspar and quartz are used in the same ceramic products, consumers prefer to buy them separately and make their own batches from the relatively pure mixtures. Obvious savings can be made by producing natural blends, and gratifying progress is being made in this direction. Materials corresponding more or less to Cornwall stone are being produced and marketed, and other mixtures are being fortified with nepheline syenite. In at least one district material, approximating graphic granite and containing almost as much quartz as feldspar, has recently found a market. It is claimed that natural mixtures of this type actually are easier to melt or frit than artificial ones.

Separating Methods

Although such developments may prolong the life of existing districts, the cheapest sources of feldspar eventually will not be pegmatites, such as are now being worked, but rather coarse-grained granites and other massive-rock formations. Very little feldspar coarser than about 20-mesh is used, and probably half the feldspar consumed is pulverised finer than 100- or even 325-mesh. At present virtually all spar is thrown away before it enters the grinding mill, unless it can be loaded with a fork having tines spaced about one-half inch apart. This is to eliminate impurities. In most granites the particles of feldspar can be freed from adhering minerals by crushing to 10-mesh, and rejects from mining operations in pegmatite deposits contain much clean spar as coarse as half an inch in diameter. Ordinary gravity methods of concentration do not separate feldspar from quartz and certain other associated minerals. In the sand sizes there are several other methods of separating the minerals, including various electrostatic and allied processes, but the most promising from a commercial standpoint are wet methods that depend upon surface properties; flotation is suitable for fine material and agglomerate tabling for coarse or sand sizes.

All natural feldspar and quartz mixtures do not behave the same when treated by agglomerate tabling and flotation. The Bureau of Mines' investigators found that this was due to the fact that feldspar is readily altered. This alteration, even when invisible, may so activate the quartz as to make it float with the feldspar. Cationic reagents, such as have proved useful in work on other acid minerals (chiefly substituted ammonium compounds and nitrogen bases) are suitable collectors, but other chemical additions were required to supplement mechanical methods of cleaning the mineral particles. Best results were obtained with lauryl amine hydrochloride and fluorine-bearing acids or salts in an acid circuit.

Substitutes for feldspar that have appeared on the market are Canadian nepheline syenite, Virginia aplite, volcanic ash, and various feldspathic rocks and slags, but the demand for feldspars still seems to be growing and should grow even faster when costs are reduced and rigidly controlled concentrated products are made from large uniform rock masses instead of from pegmatite lenses. In fashioning feldspar, nature has gone far towards assembling the raw materials for a glass batch in such form as to be melted readily.

Canadian Beryl

Another report from the same source as the above announces that the beryl deposits 175 miles N.E. of Toronto, in Renfrew County, Ontario, belonging to the newly organised Canadian Beryllium Mines and Alloys, Ltd., are to be exploited. The mines are readily accessible by road and rail. Production to date has been limited and chiefly experimental, and although the company has announced that 100 tons of beryl has been produced and is held in stock no sales have been reported. As this averages 14 per cent. beryllium oxide (about 5 per cent. metallic beryllium) it should yield about 10,000 lb. of the metal after refining.

In the two quarry openings already made on the property the beryl is irregularly distributed in pegmatite dikes which are as much as 250 feet wide in the sections uncovered. The beryl crystals range from ¼ to 12 inches in diameter and may be 5 feet in length. Selective mining and hand cobbing has been tried but proved too slow and uncertain to be satisfactory. Plans are being made at present to mine the whole mass of the dikes, separate the feldspar, and concentrate the beryl by flotation. As yet, no machinery is on the ground, and experiments are being conducted to determine the most satisfactory means of producing the metal and its alloys.

It is impossible to determine the exact extent of the deposits, as diamond drilling is impractical and reveals neither the quantity of ore available nor its beryl content. However, the property has about 3,500 acres. It was mentioned as early as 1937 in the Canadian Mineral Industry, a Government survey, and it is generally conceded to be the most promising of the beryllium deposits in Canada. Examining engineers have reported that the beryl showings on the property warrant further commercial development, although lack of demand for beryllium-copper and beryllium-nickel alloys, as well as technical problems, may limit production. It is, however, believed locally that the war will greatly augment the demand for beryl.

Export and Import Regulations

Indian and Burmese Exports

NOTIFICATION No. 58, issued by the Government of India in the Finance Department (Central Revenues), prohibits the taking by sea out of British India without the permission of the Customs Collector to any destination outside India or Burma of the following goods of importance to the chemical and allied trades:—

Abrasives, manufactured, including grinding wheels; acetate of lime; aluminium and manufactures thereof, alumina, aluminium alloys and manufactures; aluminium oxide; antimony; bakelite powder; chemicals, photographic; copper and copper ore; crucibles, graphite; dyes and dyeing substances; electric insulating material; iridium, osmiridium, iridosmine and concentrates containing iridium; lead sheets, lead pipes and tubes; magnesium and magnesium alloys; molybdenum, ferro-molybdenum and molybdenum ores and compounds; nickel, nickel ore and matte and nickel alloys in their various forms; iron and copper pyrites; platinum, crude and refined; platinum alloys and compounds; tin; tinplates and tinned sheets; toluol and toluene; tungsten, ferro-tungsten and tungsten ores; vanadium, ferro-vanadium and vanadium ores; zinc and zinc manufactures.

A similar notification from Burma prohibits the export, except under licence, of camphor, sulphur, bleaching powder and chloride, mercury and its compounds, sulphuric acid, sodium carbonate (including soda ash), sodium bicarbonate, caustic soda, potassium carbonate, caustic potash and tetra ethyl lead.

Exemptions from Import Certificate

The following categories of materials are exempt from the necessity of being provided with a "certificate of origin and interest" which is otherwise essential for goods imported into the U.K. from neutral countries in Europe, in accordance with the Import (Certificates of Origin and Interest) Order of the Board of Trade, dated October 26.

Non-metalliferous mining and quarry products of the following descriptions:—Abrasives, crude or partly manufactured; asbestos, raw, fibre and waste; asphalt and bitumen, natural; boron minerals, crude, and concentrates of boracite and rasorite; magnesite; stones and slates; sulphur. Metals and ores of the following descriptions:—Iron ore and concentrates; iron and steel scrap and waste; non-ferrous metalliferous ores and concentrates and scrap and old metal; magnesium; mercury; ferro alloy. Seeds, nuts and kernels for expressing oil, oils, fats and greases of all kinds other than essential oils, but including turpentine; gums and resins, other than synthetic. Also the following miscellaneous raw materials: Argol and other crude tartrates; slag, including basic slag; mineral phosphates of lime; tar and pitch.

Export Licences

Orders of the Board of Trade amending the schedule of goods prohibited to be exported without a licence, which came into force on November 3, affect the chemical and allied trades as follows:—

Export licences will be required for the export to any destination of platinum sheet and mercury compounds.

Export licences will no longer be required, except in the case of exports to the European and Mediterranean area (excluding France, Egypt and Palestine), for the following exports: Copal, resin (colophony), boric acid, barium nitrate, tar oil, creosote oil, anthracene oil, and other heavy coal tar oils, cobalt compounds, and thorium compounds.

No export licences will be required for export to any destination of nitric acid; certain ammonium compounds; disinfectants; and antiseptics.

Potassium Salts

A recent Board of Trade Amendment to the Export of Goods Prohibition Order adds potassium carbonate and potassium hydroxide (caustic potash) to the list of chemicals in Schedule III (O.) of prohibited exports.

Exchange Provision

The following provision of Exchange for Imported Goods has been issued by H.M. Treasury:—

(1) The importation of certain goods is prohibited except under licence issued by the Import Licensing Department of the Board of Trade. Application for foreign exchange needed to pay for imports of goods on the prohibited list should not be made until the importer is satisfied that an import licence for the goods can be obtained. In order to facilitate dealing with applications the import licence should, when possible, be produced at the time when the application for exchange is made.

(2) In *all* cases where exchange is required for the import of goods, whether the goods are on the prohibited list or otherwise, the Bank will require the production in due course of a certified copy of the Customs import entry, verifying that the goods have been imported.

(3) In order to obtain a certified copy of the Customs import entry, importers must present to the Customs *at the time of entry of the goods* an extra copy of the entry plainly marked in red ink: FOR EXCHANGE CONTROL PURPOSES ONLY.

New Control Orders

Control of Rayon

The Minister of Supply has made a second Order relating to the control of Rayon under the Defence Regulations. The main effect of this order is to increase by 1½d. per lb. the maximum prices at which rayon yarns can be bought or sold. The maximum prices of staple fibres will remain as before. Inquiries should be addressed to the Silk and Rayon Control, Ministry of Supply, Union Street Mill, Macclesfield.

Control of Molasses

The Control of Molasses and Industrial Alcohol (No.5) Order has been made by the Minister of Supply. In general it increases the maximum prices which may be charged for molasses by ten shillings a ton above pre-war prices and provision is now made for the normal charges for filling into containers and for the distribution of smaller lots down to 5 cwts. This increase is almost wholly due to marine war risk insurance charges. There will also be some increase in the price to be paid by yeast manufacturers for beet sugar molasses, but this will not result in any advance in yeast prices.

ADVERTISING BLACK-OUT CONDEMNED

The wisdom of continuing advertising during the war was stressed by Mr. Harold Eley, Dunlop advertising manager, in a recent talk to the Advertising Club of Birmingham. They could now, he said, review the situation more reasonably than was possible in the first days of September when in many quarters there was a panic tendency to "drop everything." After all, the spending power of large sections of the population, despite taxation, was greater to-day than it was two months ago. Evacuation and the movement of troops had shifted large masses of the population from one part of the country to another, but all of them still needed clothing, boots and shoes, food, fuel, soap, household appliances, and so on. It was true that to-day different firms had different problems. Some were on war work; others sold luxury products; others, products which the war had brought into greater prominence; yet none of these groups could safely regard advertising as a luxury. On the contrary, it was a fundamental source of strength to each of them, not only in selling their goods but in maintaining the goodwill established in peace time. No manufacturer could afford to allow the public to forget his name.

William Murdoch (1754-1839)

Pioneer of Gas Lighting

NOVEMBER 15 marks the centenary of the death of William Murdoch, the Scotsman who made the first practical use of gas as an illuminant. Near the ancient city of Stirling in Scotland is the Wallace Monument erected to the memory of the Scottish hero. Within this monument is a circular room which has twelve panels dedicated to the memory of Scots who have gained the reputation of doing something of extreme value for Scotland or the world. One of these panels perpetuates the name of William Murdoch, who was born in 1754, at Bellow's Miil, near Auchinleck, Ayrshire, Scotland.

Experiments in Cornwall

Murdoch, who was employed as a mechanic by Boulton and his famous partner, Watt, is entitled to the credit of first putting gas to a practical use. The inflammable qualities of the air obtained by distillation of coal had long been known, but Murdoch was the first to apply the knowledge to practical uses. It will be remembered that Boulton occupied much of his leisure in Cornwall in analysing earths, minerals and vegetable substances, trying to find out the gases they contained; Murdoch was his zealous assistant on these occasions. In the paper on the subject of lighting by coal-gas, which he communicated to the Royal Society in 1808, and for which they awarded him their large Rumford Gold Medal, he observed: "It is now nearly sixteen years since (1792), in the course of experiments I was making at Redruth, in Cornwall, upon the quantities and qualities of the gas produced by distillation from different mineral and vegetable substances, that I was induced by some observations I had previously made upon the burning of coal, to try the combustion property of the gases produced from it, as well as from peat, wood and other inflammable substances; and being struck with the great quantities of gas which they afforded, as well as the brilliancy of the light, and the facility of its production, I instituted several experiments with a view of ascertaining the cost at which it might be obtained, compared with that of equal quantities of light yielded by oil and tallow. My apparatus consisted of an iron retort, with tinned iron and copper tubes, through which the gas was conducted to a considerable distance and there, as well as at intermediate points, was burnt through apertures of various forms and dimensions. The experiments were made upon coal of different qualities, which I procured from different parts of the kingdom, for the purpose of ascertaining which would give the most economical results. The gas was also washed with water and other means were employed to purify it."

The Soho Illumination

In 1798, Murdoch contrived an apparatus for making, purifying and storing gas on a large scale. On the general illumination which took place in celebration of the Peace of Amiens in 1802, the front of the Soho Manufactory, his firm in Birmingham, was brilliantly illuminated with gas, to the astonishment and admiration of the public. The flexibility, the safety, the economy and the brilliancy of the new light being thus proved, Boulton and Watt in 1803 authorised Murdoch to proceed with the general fitting-up of the manufactory with pipes and burners, and from that date it continued to be regularly lit with coal-gas.

The advantages of the new light soon became generally recognised, and gas companies were established in most of the large towns. Had Murdoch patented the discovery, it would have proved exceedingly remunerative to him; but he derived no advantage from the extended use of the new system of lighting except the honour of having invented it—though more than one attempt was made to deprive him even of this honour. Many more inventions can be justly claimed for Murdoch, but it is chiefly his work on gas that has made his name honoured.

Ammonium Nitrate Manufacture

Improvements on the Fauser Process

IN 1929 the Italian chemist, Fauser, designed a plant in which nitric acid and ammonia were reacted in solution under a pressure slightly higher than the vapour pressure of the resulting ammonium nitrate solution. Preheated nitric acid and ammonia were continuously introduced into a reaction chamber in which no boiling could occur because an automatic valve maintained the solution under the requisite higher pressure. No loss of nitrogen could therefore take place and the neutralised solution was finally discharged through the same valve into the concentrating chamber. According to D. Maveri in a recent issue of *La Chimica e l'Industria*, ten plants with a total output capacity of 600 tons ammonium nitrate per day are operating in several countries (including Italy).

A serious drawback of the original Fauser process was that it necessitated compression of both the nitric acid and ammonia to a pressure of 4 to 6 atmospheres, depending upon the concentration of nitrate required. Modifications have now been introduced, however, which permit the reaction to be effected without loss of efficiency at only a slight excess of pressure. Nitric acid and ammonia are separately preheated in coils heated by the waste steam from the vertical reaction chamber before entering the bottom of the latter (the acid at a somewhat higher level) where they react under a pressure produced by the column of liquid above. The resulting ammonium nitrate solution is continuously moved upwards by a slowly rotating screw on a vertical axis. On reaching the upper part of the saturator the reduction in pressure causes the solution to give off steam in quantity proportional to the heat developed by the reaction, this steam being used to preheat the reactants. The ammonium nitrate produced is discharged through a hydraulic lock near the top of the saturator. As in the earlier Fauser process no ammonium nitrate can be lost as fume, because the reaction takes place wholly in the liquid phase.

With the saturator described above ammonium nitrate of 90 per cent. concentration is directly formed. This can be converted into 99.8 per cent. material in a new type of crystalliser in which advantage is taken of the heat of crystallisation of ammonium nitrate. Units with a daily production of 20 tons of this high percentage ammonium nitrate have now been installed in an Italian factory.

GERMAN PATENTS

Statements have appeared in certain newspapers, and have apparently been copied in the German Press, to the effect that enemy-owned patents, designs, copyrights and trade marks in this country are being confiscated or compulsorily transferred to non-enemies. No such action is, however, being taken. What is evidently referred to in these reports is the power given by the Patents, Designs, Copyright and Trade Marks (Emergency) Act for the grant in proper cases, and under strictly regulated procedure, to persons who are not enemies or enemy subjects of licences to work patented inventions, use registered designs, or produce or perform copyright works, belonging to enemies. The object of this legislation is to enable the articles or substances in question —which cannot now be made here or supplied to this country by the enemy proprietors concerned—to be produced here. The licences granted do not deprive the enemy owner of the property in the patent, design or copyright; and they will be made subject to proper conditions, including the payment of royalties to the Custodian of Enemy Property.

Rotproofing Sandbags

Creosote Distillate Emulsions

ON the basis of present information two types of preservative are considered to be suitable for application to sandbag revetments. They are respectively a creosote or tar distillate, used as a water emulsion, and a solution of an organic copper salt in creosote made up into an emulsion. The former is more widely available than the latter and is suitable for treatment of revetments in position which have already deteriorated by being exposed to the weather for some time. The latter is more potent, but is also more expensive and will not generally be used unless the bags are in good condition and unless it is desirable to take down the whole revetment, treat all the bags and then repile them.

The application of the preservatives should conform with the following specifications:—

(1) A creosote or tar distillate of medium creosote type applied as a water emulsion in such a quantity as to give on the exposed portion of the bag a coating of creosote not less than one-fifth of the normal dry weight of the fabric exposed. This is given approximately by a 25 per cent. creosote emulsion when sprayed on the bags to give a thorough coating, completely satisfying the absorption of the fibres. The creosote should comply with British Standard Specification No. 144/1936, "Creosote for preservation of timber." The following ingredients are suitable:—

65	parts creosote	
35	parts water	
1.2	parts oleic acid	The emulsifying agent
0.8	parts casein	
0.36	parts sodium hydroxide	

The agent is dissolved in water and the two fluids are mixed in a jet similar to that of a cream-making machine. An emulsion prepared in this way should be stable and can be transported in drums or kegs. Before use it should be diluted with water to a suitable consistency for spraying so that the creosote content does not fall below 25 per cent.

(2) An organic copper salt is dissolved in creosote or tar distillate of the type indicated in (1) above, the solution then being made up into an emulsion with water, by the use of a special type of emulsifying agent. The copper salt should be one of an organic fatty acid of high molecular weight (such as, for example, copper oleate). The organic copper salt should be added in the proportion of 16 per cent. of the weight of the creosote and the whole should be emulsified with water. When sprayed on the bags it should be applied as 20 per cent. emulsion. This will leave 0.5 to 1.0 per cent. of metallic copper, estimated on the normal weight of the fabric when conditioned under ordinary atmospheric conditions.

Spraying Methods

In applying the emulsions attention should be given to the manufacturer's instructions for dilution with water immediately before use to obtain a proper spraying consistency. The diluted solutions do not keep and it is essential that they should not be diluted further than is necessary to obtain the quantity of creosote on the bags indicated in (1) above. Either of the emulsions should preferably be applied by means of a spray though a brush application is permissible. Care should be taken to coat thoroughly any seams visible on the face of the pile and to work the emulsion well into the seams. The spraying should be done with a paint spray or horticultural spray. Care is needed to avoid fire risk during application as when handling creosote in the ordinary way. Naked lights should not be allowed in the vicinity of the work and workers should not smoke whilst spraying. The freshly creosoted revetments will have the strong odour characteristic of creosote but this will decrease to an unobjectionable amount in a few days. As creosote may cause permanent stains, suitable measures should be taken to protect the surface of buildings against which the bags are placed, whilst spraying is in progress.

LETTER TO THE EDITOR

Key Men in Scientific Industries

SIR,—May I, through your columns, give publicity to a very serious matter? In 1921 an Act of Parliament (the Safeguarding of Industries Act) was passed to give protection to a number of new industries started during 1914-1918 to manufacture materials such as laboratory porcelain, scientific, laboratory and medical glassware, fine chemicals and optical glassware. This Act has been renewed from time to time in order that Great Britain should have supplies of scientific instruments of all kinds if war came again. The duty imposed did not give sufficient protection and only part of the supplies were made in this country, much still being imported.

Now war has come again and those who have struggled to keep their industries going are asked to give increased supplies by Government departments and at the same time the War Office refuse to release men who have been called up but who are one hundred times as valuable when engaged on their civil job. It takes anything up to ten years to train men for this work.

A few days ago I saw a letter from a Government Department addressed to one of our customers in which there was a complaint that certain articles of glassware were not included in equipment recently supplied and that the whole apparatus was useless until these articles were delivered. They stated that pressure must be brought to bear upon the manufacturers. Unless they are prepared to rob another department of supplies, the only thing they could do would be to get our men back.

The same sort of thing is going on in the fine chemical industry. Any scientist reading this must wonder what has happened to our Government after their experience in 1914-1918.

I demand, in the interests of all concerned, that a special committee of technical men be appointed immediately to deal individually with cases of men whose return is required and I appeal to all scientists, especially heads of laboratories of all kinds, to support me.—I am, sir, yours faithfully,

NORMAN SHELDON, A.R.C.S. (Lond.), A.I.C.

London, W.C.2. November 6.

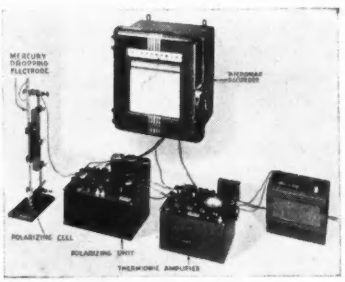
CHEMICAL CLUB

The various facilities of the Chemical Club at 2 Whitehall Court, London, S.W.1, are continuing under the motto "Business as Usual." Excellent air raid shelters exist in the club premises. There is a feeling that the club will be used more and more during time of war, since enlarged acquaintanceship and cheerful association are real factors in the present national effort. The annual meeting will be held at the Club on Tuesday, November 14, at 2 o'clock, an hour which in these days, or nights, of black-out has much to recommend it. The popularity of lunch-time meetings since the war started is expected to result in a good attendance. The report of the executive committee for the year 1938-39 speaks of a year of successful social and other activities. The committee has nominated for the ensuing year Mr. F. Arnold Green as president, and Dr. H. E. Cox as chairman of the executive committee, while the hon. treasurer and hon. secretary, Dr. S. I. Levy and Mr. F. J. Bullen, respectively, are continuing in office. The committee will recommend to the annual meeting that in view of the number of clubs that are offering temporary membership to uniformed members of H.M. Forces, the Chemical Club should provide parallel concessions by offering facilities at a nominal subscription to those who, although not in uniform, are engaged in London on Government work. This temporary measure is one likely to be highly prized by chemists and others so situated.

Recent Trade Literature

The Towers Messenger, published by J. W. TOWERS AND CO., LTD., Widnes, contains details of Dreadnought glass chemical pipe lines with the Towers ebonite tube connector. Dreadnought boro-silicate glass, it is stated, is strong but non-brittle, highly resistant to chemical attack and temperature change, and can be supplied in sizes up to 2 in. bore. The Towers tube connectors, made of Nordac ebonite, are practically unbreakable and do not corrode or seize up. They form a strong but slightly flexible full bore joint, with only the inner periphery of the washer in contact with the material being conveyed. The construction of the joint is such that assembly and dismantling is extremely simple. The ebonite union passes over the cone end of the tube, on to which a rubber sleeve is placed. The two parts of the union are then screwed together after a washer of rubber or asbestos has been placed between the ends of the tubes; these are thus pressed tightly together. Descriptions are given also of a new Oertling aperiodic, prismatic, reflecting balance for which no weights below one gram are required. This balance is an improved model of the well-known air damped aperiodic model 53GB, with the addition of an apparatus for the control of fractional weights from the outside of the case. Thus the final adjustment of a weighing may be done with the case closed and the balance released. Other instruments described include the Leitz-Jelley micro refractometer which is capable of measuring the refractive index of as little as 0.0005 c.c. of a liquid correct to within 0.0001, the Beck illumination unit for attachment to the substage of the microscope, and the Victor high efficiency metal filter pump.

Applying the dropping mercury electrode principle of analysis, a new electro-chemograph, manufactured by the LEEDS AND NORTHRUP CO., Philadelphia, U.S.A., automatically inks curves from which quantitative and qualitative analyses can be determined. Making possible quick and convenient analyses in those processes where its possibilities have been determined, the method, it is claimed, eliminates dark rooms, developing processes and delicate galvanometer systems. Drawn in sight of the operator, the curve is inked on a wide, easily-read, permanent chart. Instruments are made up of standard L. & N. mechanism. Although for the present research laboratories establishing routine procedures will probably be its principal users, the electro-chemograph is a development of great significance to the chemical and allied industries. This equipment is described in Leeds and Northrup's technical publication E-94(1).



A typical assembly of the electro-chemograph equipment

A new type of dry accumulator, which, it is claimed, has overcome the inherent defects of previous manufactures, has been marketed by VARLEY DRY ACCUMULATORS, LTD. In a folder issued by the company it is stated that the Varley dry accumulator is similar in basic principles to the standard free-acid accumulator, but its construction is such that it contains no free acid, the necessary sulphuric acid being introduced during manufacture into the elements. The accumulator consists of an extruded cylindrical lead container, the interior of which is heavily coated with spongy lead. A moist, porous flexible separator, which is unaffected by sulphuric acid, is then coated on to the interior of this negative electrode. The positive element, which is in the form of a lead cage, is inserted centrally in the cell, the whole aperture then being packed tightly with moistened peroxide of lead. One of the revolutionary principles underlying the design of the cell is the abandonment of the old idea that a large amount of free acid round the elements was necessary. The chemical action, it is maintained, is more than sufficiently performed by a minimum of acid surrounding the minute particles of the porous electrodes.

The new Varley dry accumulator

THE GENERAL ELECTRIC CO., LTD., has issued a leaflet dealing with the various types of Osram, Osglim and Osira lamps that can be employed in compliance with the A.R.P. emergency regulations. The leaflet makes a number of suggestions as to suitable lighting for the interior of factories during black-out conditions. For example, Osira 80- and 125-watt lamps with black glass ultra-violet filter bulbs may, it is suggested, be employed as emergency lighting to excite fluorescence in various special paints, dyes and plastics, and to render objects visible when treated with such substances. Various paints and dyes may also be employed which fluoresce under the direct action of the ultra-violet radiation from the lamps and continue to emit light by phosphorescence after the activating ultra-violet radiation has been switched off (as might happen if the electricity supply were damaged).

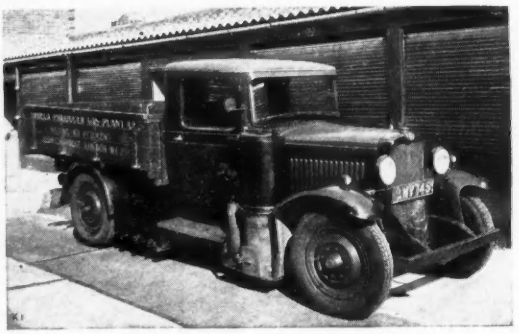
One of the vital necessities when taking precautionary measures in the event of attacks by hostile aircraft is the proper control of the supply of steam, whether in generating stations serving domestic or industrial load, or in boiler-houses in works on essential production for national service. Changing load conditions would have to be met quickly and effectively. These conditions have been met, it is claimed, by the use of Kent automatic boiler control. The equipment results in coal and air being automatically proportioned, correctly, at every point of the load. This, it is maintained, means considerable saving in fuel, and the complete absence of "blowing off" steam from the safety valves. The master controller, which acts as a "governor" on the whole boiler plant under control, definitely controls the steam pressure irrespective of load variation, and keeps it within very close limits. This master controller can be located in a safe position, where with the absolute minimum of risk one man can observe and control the boiler plant. A pamphlet describing the control has been issued recently by GEORGE KENT, LTD.

IMPERIAL CHEMICAL INDUSTRIES, LTD. are developing a process for accelerating the setting and hardening of concrete. The process, which is described in a booklet issued by the company, is in extensive use both on the Continent and in the U.S.A., where it has been successfully employed for many years. It is now being adopted by concrete manufacturers in this country who have found it particularly valuable in the present emergency. The process is essentially simple and can be operated by unskilled labour. It consists in adding a controlled amount of flake calcium chloride to the concrete during the mixing process. The addition may be made

to mixes containing either normal or rapid hardening cements. The setting rate of the concrete can be accelerated to such an extent that precast work can be removed from moulds, or shuttering from *in situ* work, in a fraction of the normal time. Not only is the speed of set increased but also the ultimate strength of the concrete. Reinforcement is unaffected by the addition and the appearance of the concrete is unchanged. A further feature is that the process enables the placing of concrete to be carried out safely during the greater part of the winter. The value of this process at the moment to manufacturers of precast concrete goods such as air-raid shelters, and to structural engineers and others who are urgently required to complete their contracts for various concrete structures, cannot be over-emphasised.

In industrial and commercial premises the necessity of providing illumination that complies with A.R.P. requirements has introduced many new problems, to meet which a range of special fittings has been developed by THE GENERAL ELECTRIC CO., LTD. Subject to complete screening of the windows of the building, the established principles of interior lighting are unaltered by the new conditions, but the time taken to provide effective screening makes it probable that a temporaty alternative in the form of very dim lighting may be permissible. A leaflet has been issued by the company illustrating the range of fittings.

Producer gas is one of the many fuel substitutes which have excited the attention of road transport users in these days of petrol rationing and restriction. Portable producer gas plants enable ordinary internal combustion engines to use various grades of coal and its solid derivatives, wood charcoal, etc., instead of liquid fuel. THE BRUSH ELECTRICAL ENGINEERING CO., LTD., Loughborough, have issued a leaflet stating that they have arranged to take over the patents, manufacture and sale of the "Koela" gas producer which in future will be marketed under the name of "Brush-Koela." The commercial incentive to use gas producers, states the Brush Co., arises from the fact that the fuel costs of, for example, a producer gas operated lorry are only 20 to



A motor lorry fitted with a "Brush-Koela" producer gas plant

25 per cent. of those for a petrol vehicle, and 50 to 60 per cent. of those for a diesel vehicle at present prices. As regards the use of producers on lorries and buses, these, it is stated, may be incorporated by converting existing vehicles or by building a producer into a specially designed vehicle. The first method is preferable, since it enables existing vehicles, with which the user is familiar, to be used.

General News——From Week to Week

SURCHARGE on cotton bleachers' charges will now be 20 per cent. (double what it was) and will apply to orders and contracts declared during November and December.

THE TWENTY-SECOND annual general meeting of the British Association of Chemists will be held at the Cafe Royal, Regent Street, London, W.1, on Saturday, November 25, 1939, at 3 p.m.

A FIRE that broke out recently at the works of the Scottish Tar Distillers, Ltd., Lime Wharf, Camelon, originated in a tar still containing pitch. It was extinguished after three hours.

IN VIEW of the importance of chemical engineering at the present juncture, the Ramsay Laboratory of Chemical Engineering at University College, London, has reopened, and students will be accepted for training in chemical engineering and research forthwith.

AN ADVANCE of 1d. per hour has been obtained by the National Union of General and Municipal Workers for employees of Millar's Chemical Works, Aberdeen, and at the vitriol works of C. Tennant & Co., Carnoustie. Several hundred members of the Union will benefit from these agreements.

OIL PRODUCTION in Alberta amounted to 3,254,269 barrels in the first half of 1939, an increase of 424,899 barrels over the corresponding period last year. A new unit for the Imperial Oil Company's refinery at Calgary is expected to be completed before the end of 1939.

SCOTLAND'S SUGAR BEET CROP this year is the best that country has ever produced, says Mr. A. G. Short, manager of Cupar Sugar Factory, the beet harvest proving even better than the experts predicted. The sugar content is also very satisfactory, the average to date being 17.18, which is 1½ per cent. above that of last year's crop.

INCLUDED AMONG the more important items of contraband detained by the Ministry of Economic Warfare since the war began are the following (in tons): Oilseed 21,000, oils and fats 8,000, phosphates 31,000, sulphur 2,500, pyrites 5,700, chlorate of potash 1,500, iron ore 81,500, steel scrap 1,150, manganese ore 38,500, molybdenum 400, wolframite 160, aluminium and bauxite 21,500, copper 8,400, lead 2,800, zinc 3,250, graphite 160, various ores and metals 1,600.

THE ENFORCED INTEREST which all concerned with export trade are now having to take in the technicalities of shipping has led to an increased demand for "Merchant Ships and Shipping," Mr. Ernest W. Blocksidge's standard book on the building and operation of merchant ships. Mr. Blocksidge is shipping surveyor to Lloyd's Register of Shipping, and his book, published by Ernest Benn, Limited, 154 Fleet Street, London, at 12s. 6d. net, deals with the technicalities of loading and stowing cargoes, etc., and the regulations governing the operation of merchant ships.

A DEMONSTRATION arranged by the Ministry of Mines on Thursday featured a number of commercial vehicles driven by a gas producer designed by the Committee appointed by the Government to investigate the practical application of producer gas for transport purposes. The producer is specially suitable for the conversion of motor vehicles in an emergency and may either be mounted on a trailer or arranged in units as desired on the vehicle itself. Low volatile anthracites and certain low temperature cokes are suitable fuels. The design is being offered free of charge to firms able and willing to undertake manufacture.

THE POSITION as to the control of feeding stuffs and fertilisers was explained to the directors of the Highland and Agricultural Society last week by Dr. J. F. Tocher, Aberdeen, analyst to the society. He pointed out that substitutes for feeding stuffs could be supplied provided that the composition of the substitutes was taken into consideration. He understood that control of prices of fertilisers was being carried out by the manufacturers' themselves: pre-war prices were still being maintained, but basic prices, he thought, might soon be brought into operation by the Ministry of Supply. In compound fertilisers the percentage of potash was being reduced. Supplies of ground phosphate might be curtailed owing to the freight and transport difficulties, but ample supplies of shell and ground lime seemed to be available. Bilston basic slag was also available.

A PAPER on "Modern Detonators" was read by Dr. W. Taylor, of Imperial Chemical Industries, Ltd., at the second meeting of the session of the Society of Chemical Industry (London section) held at the rooms of the Chemical Society, Burlington House, Piccadilly, W.1, on Monday, at 2 p.m. The chairman, Dr. T. H. Durrans, presided. Dr. Taylor gave a brief outline of modern developments in the manufacture of commercial detonators and illustrated his remarks with lantern slides. A feature of modern chemical research was, he declared, the degree to which co-operation had superseded competition among those engaged in it. Also fields of research were no longer so rigidly defined and specialised as they had been in the past.

THE CENTRAL OFFICE in London of the BRITISH NATIONAL COMMITTEE WORLD POWER CONFERENCE will be closed temporarily, and correspondence intended for the International Executive Council should be addressed to the Secretariat of the Netherlands National Committee: The Secretariat, International Executive Council, World Power Conference, Vereeniging voor Congressen op Electrotechnisch en Aanverwant Gebied, Utrechtscheweg 210, Arnhem, Holland. Correspondence for the British National Committee should, as at present, be addressed to 36 Kingsway, London, W.C.2. Special arrangements have been made with respect to the Committee's publication "Technical Data on Fuel," orders for which will be dealt with by Mr. M. W. Burt, Secretary, The Society of British Gas Industries, Uplands, Epsom Road, Guildford, Surrey.

GOOD NEWS for Devon is the announcement that, after having been abandoned for several decades, the old ochre mines at Bowden Down, Brentor, are once again the scene of activity. Large deposits of both yellow and rose ochre are in existence in that district, and at one time provided a well-known industry there. War demands are believed to be responsible for the revival, and it is recalled that use was made in 1914-18 of a dump of some hundreds of tons of ochre which had lain in a rough state by an old pit at Brentor for a long time and which was said to have been utilised for making paint for battleships. During the past few weeks workmen have been engaged in locating deposits and new pits several feet in depth have been sunk and fair supplies found. At the present time only a few truck-loads of ochre are being sent away weekly, but if the working proves successful developments on a larger scale are forecast.

Foreign News

A COMPANY, with a £20,000 capital, has been formed in Germany to manufacture cellulose from potato haulm.

IT IS reported from Oslo that all whale oil produced in factories in Norway is, by decree, to be sold to the Norwegian Government. Licences, it is stated, may be allowed.

A PLANT for the manufacture of white arsenic, understood to be the first in Italy, has been set up by the S.A. Rumianca. Arsenical pyrites from the Val d'Ossola is being used as the raw material.

BARIUM FLUOSILICATE is now replacing zinc phosphide in Egypt as a means of controlling the mole-cricket pest, according to a report published by the U.S. Department of Commerce. Zinc phosphide, though effective, had proved prohibitive in cost.

THE IMPORT into Iraq of the following goods is prohibited: Soap with more than 0.1 per cent. content-free caustic alkali, in the form of sodium hydroxide, or a total of over three per cent. free alkali in the form of anhydrous sodium carbonate; hair dyes containing diamines.

IN A PROCESS of sulphuric acid manufacture described by M. A. F. Fabre in French Pat. 842,388, powdered calcium sulphate mixed with sodium hydroxide solution is heated in a current of oxygen so as to form neutral sodium sulphate and chalk. Electrolysis of the sodium sulphate then yields both sulphuric acid and sodium hydroxide, the latter being returned to the cycle of production.

THE PAST YEAR'S production of superphosphate by the Danish fertiliser manufacturing combine, A/S Dansk Svovlsyre of Superphosphat-Fabrik, rose to 384,000 tons. This breaks all previous output records in the history of the combine. The actual sale was, however, only 354,000 tons or 9,000 tons less than the year before—a result chiefly ascribed to failing export trade. On July 1, when the company's financial year ended, the stock of superphosphate was 116,000 tons as compared with 86,000 tons on the same day of 1938.

MANUFACTURE of carbon bisulphide in a continuous process is outlined in German Patent Application D 79,124 of the Deutsche Gold-und Silberscheideanstalt. Carbon oxysulphide is here reacted with a carbonaceous material (wood charcoal, coke, lignite, turf, pitch) at 800 to 1,000° C. and the resulting carbon bisulphide extracted by cooling under pressure or by scrubbing with a hydrocarbon oil. Carbon monoxide formed at the same time is converted into fresh carbon oxysulphide by reacting with sulphur.

THE DEVELOPMENT of a new adhesive for wood, by J. L. Rangel, a chemist at the Instituto Nacional de Tecnologia, Rio de Janeiro, is reported in *Industrial and Engineering Chemistry*. The material consists of two parts, a urea-formaldehyde condensation product with a starch filler, and a 15 per cent. solution of ammonium chloride, to be applied separately to the two joining surfaces. Although the product is somewhat less resistant to traction and shearing than casein or bone glue, its resistance to humidity and cold water is much greater.

THE PRODUCTION in the U.S.A., in August, 1939, of 8,797,000 gallons brings the total benzol output for the first eight months of 1939 to 59,379,000 gallons. This figure represents a decided increase above the amount of 42,785,000 gallons produced in the same period in 1938, according to data compiled by the U.S. Bureau of Mines, and estimated from the production of coke at by-product ovens which reported recovering this commodity. The figures given represent gallons of crude and refined benzol plus motor benzol.

A GOVERNMENT COMMITTEE has been set up in Mexico under the chairmanship of Mr. Eduardo Suarez, Minister of Finance, to undertake the formation and control of the cellulose industry in Mexico. Plans for the construction of a factory, to be erected at an estimated cost of three million pesos, have been prepared by Mr. Fernando Galvan, managing director of the Productura de Papel S.A., Mexico's leading paper manufacturer, and approved by the committee. Mr. Suarez stated that the Government would provide half the money required, the remainder being obtained from the sale of shares, preference being given to subscriptions from Mexican workmen.

NITROPENTAGLYCERINE, a potential substitute for nitroglycerine, is discussed in a recent paper by R. Colson (*Industrie Chimique*, Sept. 1939, 598). Pentaglycerine is formed by condensation of formaldehyde with propionic aldehyde in presence of lime and is a white crystalline solid, highly soluble in water and melting at 200° C. On nitration it forms a trinitrate, an extremely explosive liquid closely resembling nitroglycerine. Nitration proceeds without danger when using highly concentrated acids (fuming nitric acid alone or a 55 : 45 mixture of sulphuric and nitric acids). The trinitrate is obtained in 90 per cent. yield.

INCREASED PRODUCTION of ammonium nitrate in Italy, is the object of a recently issued decree. Firms operating ammonium nitrate plants in that country are obliged to complete and perfect these plants for the production of ammonium nitrate carrying 34.8 per cent. nitrogen, and bring them up to total capacity before December 31, 1939. During certain periods ammonium nitrate of 34.8 per cent. nitrogen content fine may be used for the production of ammonium nitrate for agricultural use. To this effect a special order will be given by the Minister of Corporations upon proposition of the Commissariat General for War Manufactures. Firms not complying with the above provisions will be fined with penalties up to 10,000 lire and, by decree of the Minister of Corporations, their plant may be temporarily closed.

POLYSILICATES of very low apparent density are obtained by a process described in French Pat. 836,782 (Dessaux Fils and J. Beaufils). Starting from sodium pentasilicate, which is stated to result from treatment of ordinary soidum silicate with a small proportion of ethyl acetate, a series of heavy metal polysilicates is produced by precipitation with an appropriate soluble salt. Bismuth pentasilicate, for example, with an apparent density of 0.20 and possessing great covering power, is prepared by stirring a solution of 0.11 kg. neutral bismuth nitrate in 0.17 kg. glycerine and 0.55 kg. water with a solution of 1 kg. sodium pentasilicate in 2 kg. water. Silver octosilicate (apparent density 0.20) and zinc pentasilicate (apparent density 0.15) are prepared in a similar manner.

PERSONAL NOTES

MR. E. HARRISON, manager of Acklam and Newport coke ovens, and of the by-product plants of Dorman Long and Co., has been elected chairman of the Coke Oven Managers' Association (Northern Section).

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MR. R. B. POTTER has recently been appointed Chairman of Messrs. Simon-Carves, Ltd., Engineers, of Cheadle Heath, Stockport. Mr. Potter joined the staff of Simon-Carves, Ltd., in 1921, became a director in 1931, and was appointed Vice-Chairman of the Company in 1937.

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SIR JOHN DONALD POLLOCK, Bart., a director of British Oxygen, Ltd., and chairman and managing director of Metal Industries, Ltd., was last week elected Rector of the University of Edinburgh, defeating his opponent, Mr. Edwin Muir, by a majority of 643 votes.

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MR. P. CALDWELL, MAJOR L. B. HOLLIDAY, PROFESSOR J. KENNER, MR. D. R. MACKAY, MR. N. G. MCCULLOCH and MR. C. M. WHITTAKER have been appointed by the Board of Trade to advise and assist the Controller of Dyestuffs as members of a newly-formed Dyestuffs Control Committee.

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DR. CHARLES M. A. STINE, a member of the Board of Directors of E.I. du Pont de Nemours and Company, has been elected to receive the Perkin Medal of the Society of Chemical Industry for 1940. The medal is awarded annually for valuable work in applied chemistry, the selection being made by a committee representing the five chemical societies in the United States.

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The Chemical Industry Medal for 1939 was presented yesterday to DR. ROBERT E. WILSON, President of Pan American Petroleum and Transport Company, at a joint meeting of the American Section of the Society of Chemical Industry, the New York Section of the American Chemical Society and the New York Section of the American Institute of Chemical Engineers, held at the Chemists' Club, New York City.

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Huddersfield A.R.P. Committee have appointed the following as Gas Identification Officers: DR. J. W. WHITAKER, Principal of Huddersfield Technical College; MR. H. H. GRAY, lecturer in Chemistry at the Technical College; DR. H. H. GOLDTHORPE, chemist and bacteriologist at the Corporation Sewage Works; and MR. C. E. RANDOLPH, analytical chemist at the British Dyestuffs Corporation, Limited.

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The William H. Nichols Medal of the New York Section of the American Chemical Society has been awarded for 1940 to DR. JOHN M. NELSON, professor of organic chemistry at Columbia University, "for important contributions to the chemistry of life processes." Professor Nelson, who graduated for the University of Nebraska in 1901, is cited by the medal jury as an internationally recognised authority on the isolation and purification of naturally occurring enzymes and the quantitative study of their mode of action. During the past year he succeeded in obtaining a crystalline protein with characteristics similar to tyrosinase, an oxidase.

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PROFESSOR J. W. COOK, who formerly occupied the Chair of Chemistry in the University of London, assumed his duties as Regius Professor of Chemistry in the University of Glasgow last week. He was formally welcomed by Principal Sir Hector Hetherington, who reminded him that he was the sixth occupant of the Chair, which was founded in 1818. Some exceptional demands were likely to be made on Professor Cook's department, and apart altogether from these he would have the responsibility of completing and furnishing the new Chemistry Institute. The subject of Professor Cook's inaugural lecture was "Synthetic Chemistry in Biology and Medicine."

The following awards of medals have been made by the President and Council of the Royal Society:—The Copley Medal to PROFESSOR T. H. MORGAN, for his establishment of the modern science of genetics; the Davy Medal to PROFESSOR J. W. MCBAIN for his distinguished work in the study of colloidal electrolytes; and the Hughes Medal to PROFESSOR G. P. THOMSON, for his important discoveries in connection with the diffraction of electrons by matter.

OBITUARY

MR. CHARLES E. PARKER, who was founder and chairman of the Penketh Tanning Company, Ltd., died on October 30, aged 83.

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MR. DAVID PATON, who died recently at Stirling, had carried on the business of the Stirlingshire Rubber Co. for about 40 years, up to his retiral in 1935.

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DR. G. D. LANDER, who was formerly professor of Chemistry and Toxicology at the Royal Veterinary College, Camden Town, London, died recently.

* * * *

MR. WILLIAM FRANCIS MERRITT, a director of Stafford Allen and Sons, Ltd., of which he was also secretary, joining the board of directors in 1922, died recently at the age of 59. He was chiefly responsible for introducing and marketing pyrethrum insecticide—a speciality of the firm.

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MR. ALEXANDER GRAY, a director of the firm of Farquhar and Gill, Ltd., paint manufacturers, St. Paul Street, Aberdeen, has died at his residence, 71 King's Gate, Aberdeen, at the age of 79. He served the firm for about 45 years, first as cashier and then as manager, before becoming a director. He resigned from the board in 1928, but continued as secretary until his retirement early this year.

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MR. HENRY SWIRES ELLISON, of The Manor House, Birkenshaw, a director of Yorkshire Tin Distillers, Ltd., Cleckheaton, and MR. WILLIAM WOOD, of Eskdale, Bradford Road, Oakenshaw, Bradford, the secretary of the same company, both died on November 1. Mr. Ellison was buried at Cleckheaton last Saturday, interment following a service in Birkenshaw Parish Church. The funeral of Mr. Wood took place on the same day at Cleckheaton New Cemetery. At both funerals a number of business associates of the two men in the chemical industry in Yorkshire were present.

TWENTY YEARS AGO

THE enormous impetus given to the Canadian chemical industry, due to the war, was referred to by THE CHEMICAL AGE in its issue of November 8, 1919, extracts being published from a report issued by the Dominion Bureau of Statistics.

"This report," THE CHEMICAL AGE stated, "contains a directory of Canadian chemical industries with names, addresses and products of firms whose products are either chemicals or are the results of processes involving chemical change. The number of plants operated is given as 634, 161 of which are situated in the Province of Quebec. The outstanding progress made during the war was probably the construction of the world's largest glacial acetic acid plant at Shawinigan, Quebec. An entirely new process beginning with acetylene was developed; while acetone, paraldehyde, crotonaldehyde, mercuric oxide and manganese acetate are now also being produced, and magnesium of a purity ranging from 99 per cent. to 99.9 per cent. is made electrolytically from its fused salts."

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Applications for Patents

MANUFACTURE OF LIGHT HYDROCARBONS BY CATALYSIS.—C. Arnold (Standard Oil Co.). 27779.

PRODUCTION OF THIOPHENE.—M. H. M. Arnold, and Imperial Chemical Industries, Ltd. 27736.

PROCESS FOR THE MANUFACTURE OF RESINOUS CONDENSATION PRODUCTS.—Beck, Koller and Co. (England), Ltd. (Hodgins and Hovey). 28137.

PREPARATION AND USE OF ACIDIC CATALYSTS.—Beck, Koller, and Co. (England), Ltd. (Hodgins and Hovey). 28139.

PRODUCER-GAS INSTALLATIONS.—H. Bowen, and E. R. Wakefield. 28167.

FILTERS FOR PRODUCER-GAS INSTALLATIONS.—H. Bowen, and E. R. Wakefield. 28168.

MANUFACTURE OF ACRYLIC ACID and its derivatives.—J. H. Brown, A. V. Jones, and Imperial Chemical Industries, Ltd. 27853.

SYNTHETIC RESIN ADHESIVES OR CEMENTS.—N. A. de Bruyne, C. A. A. Rayner, Aero Research, Ltd., and De Havilland Aircraft Co., Ltd. 27876.

WATER-SOLUBLE MONOAZO DYESTUFFS.—E. W. Christie, A. H. Knight, F. H. Pearman, and Imperial Chemical Industries, Ltd. 27854.

PRODUCTION OF DEXTROSE.—Corn Products Refining Co. (United States, Oct. 21, '38.) 27773.

MANUFACTURE OF ALKALI METAL SILICATE DETERGENTS.—J. Crosfield and Sons, Ltd. (United States, Oct. 31, '38.) 27815.

POLYMERISATION OF ORGANIC COMPOUNDS.—Distillers Co., Ltd., and H. P. Staudinger. 27865.

MANUFACTURE OF BUTADIENE.—E. I. du Pont de Nemours and Co. (United States, Oct. 12, '38.) 27737.

MANUFACTURE OF CHLOROBUTENE.—E. I. du Pont de Nemours and Co. (United States, Oct. 12, '38.) 27738.

MANUFACTURE OF TRICHLOROBUTANE.—E. I. du Pont de Nemours and Co. (United States, Oct. 12, '38.) 27739.

MANUFACTURE OF CHLOROBUTADIENE.—E. I. du Pont de Nemours and Co. (United States, Oct. 12, '38.) 27740.

MANUFACTURE OF SUBSTITUTED ARYLAMINES.—E. I. du Pont de Nemours and Co. (United States, Oct. 13, '38.) 27856.

TREATMENT OF ORGANIC FIBROUS MATERIALS.—E. I. du Pont de Nemours and Co. (United States, Oct. 13, '38.) 27857.

MANUFACTURE OF ETHENONES.—E. I. du Pont de Nemours and Co. (United States, Oct. 13, '38.) 27858, 27859.

MANUFACTURE OF CONDENSATION PRODUCTS from chlorinated hydrocarbons.—Edeleanu Ges. (Germany, Oct. 15, '38.) 27977; (Germany, March 3.) 27978; (Germany, June 2.) 27979.

PROCESS AND APPARATUS FOR MODIFYING THE PHYSICAL, CHEMICAL, ETC., PROPERTIES OF SUBSTANCES.—J. Ehrlich. 28134.

PROCESS FOR DECARBURISING METALS.—Electro Metallurgical Co. (United States, Nov. 17, '38.) 28136.

MANUFACTURE OF LIGHT POLARISERS.—International Polaroid Corporation. (United States, Oct. 29, '38.) 28058.

MANUFACTURE OF HYDROGEN and carbon monoxide.—Koppers' Industrieele Maatschappij, H. (Germany, Oct. 17, '38.) 28053.

METHOD OF MANUFACTURING CHLORATE and perchlorate explosives.—E. Lorenzini. 28145.

PRODUCER-GAS GENERATORS.—A. C. Morrison, and A. E. Morrison. 27924.

PROCESS FOR THE PRODUCTION OF LUBRICANTS.—N. V. de Bataafsche Petroleum Maatschappij. (France, Nov. 4, '38.) 27832.

PREPARATION OF SALTS or esters of 2-keto aldonic acids.—C. Pfizer and Co. (United States, Dec. 24, '38.) 28060; (United States, Aug. 5.) 28061, 28062.

REFINING OF FATTY OILS.—Sharples Corporation. (United States, Oct. 20, '38.) 28065; (United States, Oct. 20, '38.) 28066; (United States, Feb. 28.) 28067.

PROCESS FOR IMPROVING DYEING and prints obtained by means of water-soluble dyestuffs.—Soc. of Chemical Industry in Basle. (Switzerland, Oct. 13, '38.) 27722; (Switzerland, Dec. 21, '38.) 27723; (Switzerland, Sept. 27.) 27724.

MANUFACTURE OF BRANCHED-CHAIN PARAFFIN HYDROCARBONS.—Standard Oil Co. (United States, Dec. 14, '38.) 28082.

PROCESS FOR THE SEPARATION OF OLEFINES from mixtures of hydrocarbons.—Standard Oil Development Co. (United States, Dec. 29, '38.) 27829.

TREATMENT OF HYDROCARBONS with mineral acids.—Standard Oil Development Co. (United States, Dec. 7, '38.) 27988.

MANUFACTURE OF LUBRICANTS.—Union Oil Co. of California. (Jan. 17, '38.) (United States, Aug. 2, '37.) 28000.

ACID-RESISTANT CEMENTS AND CONCRETES.—R. Ward, and Imperial Chemical Industries, Ltd. 28149.

PREPARATION OF COPOLYMERS of butadiene and vinylidene chloride.—Wingfoot Corporation. (United States, Nov. 25, '38.) 27841.

MANUFACTURE OF CERAMIC BODIES.—Battelle Memorial Institute. (United States, Dec. 24, '38.). 28650.

Complete Specifications Open to Public Inspection

PROCESS FOR THE EXTRACTION OF AIR from ceramic pastes.—H. Koppers' Industrielle Maatschappij, N.V. March 30, 1938. 9702/39.

PROCESS FOR THE EXTRACTION OF MIXTURES of isomeric organic compounds.—N. V. de Bataafsche Petroleum Maatschappij. March 30, 1938. 9711/39.

METHOD FOR THE PREPARATION OF ARTIFICIAL CRYOLITE.—Silikon Ges. Ausarbeitung Und Verwertung Industriller Verfahren. March 30, 1938. 9793/39.

MANUFACTURE OF AZO DYESTUFFS.—I. G. Farbenindustrie. March 30, 1938. 9847/39.

PROCESS FOR THE PRODUCTION of therapeutically valuable symmetric diaryl-dialkyl-ethylene compounds substituted in the aromatic ring by hydroxyl groups.—Richter Gedeon Vegyeszeti Gyar Reszvenytarsasag. March 30, 1938. 9856/39.

Specifications Accepted with Date of Application

CONTROLLING THE ODOUR OR FLAVOUR OF EDIBLE OILS AND FATS. H. O. Renner. Dec. 14, 1937. 513,514.

COLOURING OF ORGANIC DERIVATIVES OF CELLULOSE.—Kodak, Ltd. Jan. 14, 1937. 513,414.

MANUFACTURE OF ARTIFICIAL PLASTIC MASSES and textile fibres.—British Glycerine Manufacturers, Ltd. (J. Carlier). Feb. 9, 1938. 513,465.

MANUFACTURE OF HYDROCARBON POLYMERS.—Standard Oil Development Co. April 9, 1937. 513,521.

PREPARATION OF SULPHONATED ORGANIC MATERIALS.—National Oil Products Co. March 2, 1937. 513,365.

PRODUCTION OF DYES and their use for sensitising photographic silverhalide emulsions.—Du Pont Film Manufacturing Corporation. March 9, 1937. 513,471.

SEPARATING CORPUS LUTEUM HORMONE and androstendione from sterol degradation products.—Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R. T. (Dr. Kereszty and Dr. Wolf). March 26, 1937. (Cognate Application, 9078/38.) 513,525.

PRODUCTION OF ANILINE AND TOLUIDINE DERIVATIVES.—Manchester Oxide Co., Ltd., J. H. Clayton, and B. Bann. March 29, 1938. (Cognate Applications, 9525/38, 23157/38, 4090/39 and 4091/39.) 513,473.

PRODUCTION OF AZO DYESTUFFS on cellulosic materials, and of intermediates therefor.—K. H. Saunders, and Imperial Chemical Industries, Ltd. April 1, 1938. 513,323.

IMPROVING THE PROPERTIES OF RESIN THREADS or the like.—I. G. Farbenindustrie. May 5, 1937. 513,327.

MANUFACTURE OF AZO DYESTUFFS.—A. H. Knight, and Imperial Chemical Industries, Ltd. April 4, 1938. 513,419.

VERTICAL CARBONISING RETORTS.—H. Wood. May 8, 1937. 513,480.

METHOD OF AND MEANS FOR EFFECTING AUTOMATICALLY the removal of a liquid constituent from a system under fluid pressure containing a liquid constituent in admixture with a gaseous or vapour constituent.—British Oxygen Co., Ltd., and B. J. Mead. April 5, 1938. 513,481.

APPARATUS FOR MEASURING CHLORINE or other gas and particularly suitable for use in connection with the proportional dosage of water.—F. P. Candy. April 7, 1938. 513,489.

MANUFACTURE OF AZO-DYESTUFFS.—Soc. of Chemical Industry in Basle. April 15, 1937. 513,337.

DRYING-STOVES for pottery and other goods.—W. Boulton, Ltd., and E. M. Breeze. April 12, 1938. 513,539.

REFINING PHENOLS.—Deutsche Erdol, A.-G. April 27, 1937. 513,541.

METHODS OF APPLYING LUMINESCENT SUBSTANCES TO SURFACES.—Soc. Anon. pour les Applications de l'Electricite et des Gaz Rares Etablissements C. Paz and Silva. Jan. 31, 1938. 513,505.

CONVERSION OF MINERAL OILS INTO GASOLINE.—A. H. Stevens (Standard Oil Co. (Indiana)). April 12, 1938. (Addition to 510,155.) 513,545.

PROCESSES AND APPARATUS FOR THE MANUFACTURE OF PRIMARY OXYALKYLAMINES.—Usines de Melle. April 16, 1937. 513,508.

MANUFACTURE OF MELAMINE.—Soc. of Chemical Industry in Basle. July 24, 1937. 513,383.

STABILISING POLYVINYL ACETAL RESINS.—Shawinigan Chemicals, Ltd. Aug. 13, 1937. 513,350.

PROCESS FOR THE MANUFACTURE OF AZO DERIVATIVES of substituted barbituric acids.—Kodak, Ltd. Jan. 14, 1937. (Divided out of 513,414.) 513,462.

IMPROVING THE PROPERTIES OF FABRICS made of resin threads.—I. G. Farbenindustrie, and W. W. Groves. April 4, 1938. (Divided out of and addition to 513,327.) 513,354.

PROCESS FOR THE PREPARATION OF ISOQUINOLINE DERIVATIVES.—F. Kulz, and C. A. Hornung. Dec. 3, 1937. (Divided out of and addition to 512,560.) 513,512

BERYLLIUM ALLOYS.—Seri Holding Soc. Anon. (June 30, 1937.) 513,773.

PRODUCTION OF FUSIBLE SOLUBLE RESINS.—I. Rosenblum. (Jan. 7, 1938.) 513,576.

Weekly Prices of British Chemical Products

QUITE a good volume of inquiry for new business has been in evidence during the week both for home trade and export and deliveries against existing contracts cover fairly substantial quantities. Most of the heavy acids continue in good demand and steady activity is reported for acetone, formaldehyde, and the majority of the soda and potash compounds. Supplies of lithopone from overseas sources are enabling dealers to meet a fairly active demand. Values generally for industrial chemicals are steady and in some directions quotations have an upward tendency. Some expansion in the demand for coal tar products has been noted during the past week and prices continue very firm. An upward movement in quotations is noted for such items as creosote, solvent naphthas, pitch and xylol. The supply position generally is good, although in some cases spot parcels are not readily obtainable.

MANCHESTER.—Firm price conditions are reported in virtually every section of the Manchester chemical market and a continued scarcity of spot offers of a number of products, particularly potash compounds, values of which are largely nominal in consequence. Buying interest during the past week in the leading soda and other heavy materials has been on a fair scale and a steady call for deliveries against contracts has been reported. Most classes of tar products have met with a good demand and prices are steady to firm throughout the market.

GLASGOW.—The demand for chemicals continues in the Scottish heavy chemical market and prices show a tendency to advance in all sections.

Price Changes

Rises: Copper Sulphate (Manchester); Sodium Sulphide (Manchester); Benzol 90's; Benzol, pure; Creosote, home trade; Naphtha, all grades; Naphthalene, crude; Pitch; Toluol, 96%; Xylol, pure.

*In the case of certain products, here marked with an asterisk, the market is nominal, and the last ascertainable prices have been included.

†Coal Tar Products: The position with regard to prices of benzol and toluol is still fluid, owing to possibilities of control.

General Chemicals

ACETIC ACID.—Maximum prices per ton: 40% technical, 1 ton or over, £15 12s.; 10 cwt. and less than 1 ton, £16 12s.; 4 cwt. and less than 10 cwt., £17 12s.; 80% technical, 1 ton, £29 5s.; 10 cwt./1 ton, £30 5s.; 4/10 cwt., £31 5s.; 80% pure, 1 ton, £31 5s.; 10 cwt./1 ton, £32 5s.; 4/10 cwt., £33 5s.; commercial glacial, 1 ton, £37; 10 cwt./1 ton £38; 4/10 cwt., £29; delivered buyers' premises in returnable barrels.

ACETONE.—Maximum prices per ton, 50 tons and over, £39; 10/50 tons, £39 10s.; 5/10 tons, £40; 1/5 tons, £40 10s.; single drums, £41 10s., delivered buyers' premises in returnable drums or other containers having a capacity of not less than 45 gallons each; delivered in containers of less than 45 gallons but not less than 10 gallons £10 10s. per ton in excess of maximum prices; delivered in containers less than 10 gallons each £10 10s. per ton in excess of maximum prices, plus a reasonable allowance.

*ALUM.—Loose lump, £8 7s. 6d. per ton d/d.

*ALUMINIUM SULPHATE.—£7 5s. 0d. per ton d/d Lancs.

AMMONIA, ANHYDROUS.—99.95%, 1s. to 2s. per lb. according to quantity in loaned cylinders, carriage paid; less for important contracts.

AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks.

AMMONIUM CHLORIDE.—Grey galvanising £21 per ton, in casks, ex wharf. See also Salammoniac.

AMMONIUM DICHROMATE.—1s. per lb. d/d U.K.

*ANTIMONY OXIDE.—£68 per ton.

ARSENIC.—Prices nominal, f.o.b. Antwerp, subject to works acceptance.

BARIUM CHLORIDE.—Market nominal.

BLEACHING POWDER.—Spot, 35/37% £9 5s. per ton in casks, special terms for contract.

BORAX COMMERCIAL.—Granulated, £18 per ton; crystal, £19; powdered, £19 10s.; extra finely powdered, £20 10s.; B.P. crystals, £27; powdered, £27 10s.; extra fine, £28 10s. per ton, in free 1-cwt. bags, carriage paid in Great Britain. Borax Glass, lump, £60; powder, £61; in tin-lined cases for home trade only, packages free, carriage paid in Great Britain.

BORIC ACID.—Commercial granulated, £32 per ton; crystal, £33; powdered, £34; extra finely powdered, £36; large flakes, £44 10s.; B.P. crystals, £41; powdered, £42; extra fine powdered, £44 per ton for ton lots, in free 1-cwt. bags, carriage paid in Great Britain.

CALCIUM BISULPHITE.—£7 5s. per ton f.o.r. London.

*CALCIUM CHLORIDE.—GLASGOW: 70/75% solid, £5 12s. 6d. per ton ex store.

CHARCOAL LUMP.—£7 5s. to £11 per ton, ex wharf. Granulated £7 to £9 per ton according to grade and locality.

*CHLORINE, LIQUID.—£18 15s. per ton, seller's tank wagons, carriage paid to buyer's sidings; £19 5s. per ton, d/d in 16/17 cwt. drums (3-drum lots); £19 10s. per ton d/d in 10-cwt. drums (4-drum lots); 4½d. per lb. d/d station in single 70-lb. cylinders.

*CHROMETAN.—Crystals, 3d. per lb.; liquor, £13 per ton d/d station in drums.

CHROMIC ACID.—10¾d. per lb., less 2½%: d/d U.K.

*CHROMIC OXIDE.—11¾d. per lb.; d/d U.K.

CITRIC ACID.— 1s. 1d. per lb. MANCHESTER: 1s. 1¼d..

COPPER SULPHATE.—MANCHESTER: £24 5s. per ton f.o.b.

CREAM OF TARTAR.—100%, £5 2s. to £5 7s. per cwt., less 2½%.

FORMALDEHYDE.—40% by volume, £25 to £27 per ton, according to quantity, in casks, ex store.

FORMIC ACID.—85%, £42 per ton for ton lots, ex store, in cylinders; smaller parcels quoted at 45s. 6d. to 47s. 6d. per cwt., ex store.

GLYCERINE.—Chemically pure, double distilled, 1,260 s.g., in tins, £3 10s. to £4 10s. per cwt. according to quantity; in drums, £3 2s. 6d. to £3 16s. 0d. Refined pale straw industrial, 5s. per cwt. less than chemically pure.

HEXAMINE.—Technical grade for commercial purposes, 1s. 4d. per lb.; free-running crystals are quoted at 1s. 7d. per lb.; carriage paid for bulk lots.

HYDROCHLORIC ACID.—Spot, 5s. 6d. to 8s. carboy d/d according to purity, strength and locality.

IODINE.—Resublimed B.P., 11s. 2d. per lb. in 7 lb. lots.

*LACTIC ACID.—(Not less than ton lots). Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50%, by vol., £41. One ton lots ex works, barrels free.

LEAD ACETATE.—LONDON: White, £48 to £50, ton lots. MANCHESTER: Market nominal. GLASGOW: Market nominal.

LEAD NITRATE.—About £40 per ton in casks.

LEAD, RED.—English, 5/10 cwt., £35; 10 cwt. to 1 ton, £34 15s.; 1/2 tons, £34 10s.; 2/5 tons, £34; 5/20 tons, £33 10s.; 20/100 tons, £33; over 100 tons, £32 10s. per ton, less 2½ per cent. carriage paid; non-setting red lead, 10s. per ton dearer in each case; Continental material, £1 per ton cheaper.

LEAD, WHITE.—Dry English, less than 5 tons, £45; 5/15 tons, £41; 15/25 tons, £40 10s.; 25/50 tons, £40; 50/200 tons, £39 10s. per ton, less 5% carriage paid; Continental material £1 per ton cheaper. Ground in oil, English, 1/5 cwt., £53; 5/10 cwt., £52; 10 cwt. to 1 ton, £51 10s.; 1/2 tons, £50; 2/5 tons, £49; 5/10 tons, £47; 10/15 tons, £46; 15/25 tons, £45 10s.; 25/50 tons, £45; 50/100 tons, £44 10s. per ton, less 5% carriage paid. Continental material £2 per ton cheaper.

LITHARGE.—10 cwt.-1 ton, £34 15s. per ton.

MAGNESITE.—Calcined, in bags, ex works, about £9 to £10 per ton.

MAGNESIUM CHLORIDE.—Solid (ex wharf), £10 per ton.

*MAGNESIUM SULPHATE.—Commercial, £5 10s. per ton, ex wharf.

MERCURY PRODUCTS.—Controlled prices for 1 cwt. quantities: Bichloride powder, 6s. 4d.; bichloride (industrial users), 6s. 4d.; bichloride lump, 6s. 11d.; bichloride ammon. powder, 7s. 10d.; bichloride ammon. lump, 7s. 8d.; mercurous chloride, 7s. 8d. mercury oxide, red cryst., B.P., 9s.; red levig. B.P., 8s. 6d.; yellow levig. B.P., 8s. 4d.

*METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities.

*NITRIC ACID.—Spot, £25 to £30 per ton, according to strength, quantity and destination.

OXALIC ACID.—£48 5s. per ton for ton lots, ex wharf, in casks, smaller parcels, 53s. to 57s. per cwt., ex store; deliveries slow.

*PARAFFIN WAX.—GLASGOW: 3¾d. per lb.

*POTASH, CAUSTIC.—Market nominal.

POTASSIUM CHLORATE.—Imported powder and crystals, ex store London, 10d. to 1s. per lb.

*POTASSIUM DICHROMATE.—5¼d. per lb. carriage paid. GLASGOW: 5¼d. per lb., net, carriage paid.

POTASSIUM CHROMATE.—2s. per lb. d/d U.K.

POTASSIUM IODIDE.—B.P., 9s. 10¾d. per lb. in 7 lb. lots; for not less than 1 cwt., 7s. 9d. per lb.

POTASSIUM NITRATE.—Small granular crystals, £26 to £29 per ton ex store, according to quantity.

POTASSIUM PERMANGANATE.—Commercial, about 10¾d. per lb., delivered.

POTASSIUM PRUSSIATE.—Yellow, market nominal, supplies scarce.

SALAMMONIAC.—Dog-tooth crystals, £40 per ton; medium, £39; fine white crystals, £20; in casks, ex store.

SALT CAKE.—Unground, spot, £3 15s. per ton.
SODA ASH.—Light 98/100%, £5 17s. 6d. per ton f.o.r. in bags.
SODA, CAUSTIC.—Solid, 76/77° spot, £13 10s. per ton d/d station.
SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.
SODIUM ACETATE.—£25 to £26 per ton, ex wharf.
SODIUM BICARBONATE.—About £10 10s. per ton, in bags.
SODIUM BISULPHITE POWDER.—60/62%, £12 10s. to £14 per ton d/d in 2-ton lots for home trade.
SODIUM CARBONATE MONOHYDRATE.—£20 per ton d/d in minimum ton lots in 2 cwt. free bags.
SODIUM CHLORATE.—£27 10s. to £32 per ton, d/d according to quantity.
*SODIUM DICHROMATE.—Crystals cake and powder 4¼d. per lb. net d/d U.K. with rebates for contracts. GLASGOW: 4¼d. per lb., carriage paid.
*SODIUM CHROMATE.—5d. per lb. d/d U.K.
SODIUM HYPOSULPHITE.—Pea crystals, £15 15s. per ton for 2-ton lots; commercial, £11 15s. per ton. MANCHESTER: Commercial, £11; photographic, £15 10s.
*SODIUM METASILICATE.—£14 5s. per ton, d/d U.K. in cwt. bags.
SODIUM NITRATE.—Refined, £8 5s. per ton for 6-ton lots d/d.
SODIUM NITRITE.—£18 5s. per ton for ton lots.
SODIUM PERBORATE.—10%, £4 per cwt. d/d in 1-cwt. drums.
SODIUM PHOSPHATE.—Di-sodium, £16 to £17 per ton delivered for ton lots. Tri-sodium, £18 10s. per ton delivered per ton lots.
SODIUM PRUSSIATE.—4¼d. to 5¼d. per lb.
SODIUM SILICATE.—£8 2s. 6d. per ton.
*SODIUM SULPHATE (GLAUBER SALTS).—£3 per ton d/d.
*SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 to £3 10s. per ton d/d station in bulk. MANCHESTER: £3 15s.
SODIUM SULPHIDE.—Solid 60/62%, Spot, £11 15s. per ton d/d in drums; crystals, 30/32%, £9 per ton d/d in casks. MANCHESTER: Concentrated solid, 60/62%, £13 10s.; commercial, £9 10s.
*SODIUM SULPHITE.—Pea crystals, spot, £14 10s. per ton d/d station in kegs.
*SULPHUR PRECIP.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.
SULPHURIC ACID.—168° Tw., £4 11s. to £5 1s. per ton; 140° Tw., arsenic-free, £3 to £3 10s.; 140° Tw., arsenious, £2 10s.
TARTARIC ACID.—1s. 2d. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. MANCHESTER: 1s. 2d. per lb.
ZINC OXIDE.—Maximum prices: White seal, £23 10s. per ton; red seal, £21 d/d; green seal, £22 10s. d/d buyers' premises.
*ZINC SULPHATE.—Tech., £11 10s. f.o.r., in 2-cwt. bags.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 8d. to 1s. 4d. per lb., according to quality. Crimson, 1s. 8½d. to 1s. 9½d. per lb.
ARSENIC SULPHIDE.—Yellow, 1s. 6d. to 1s. 8d. per lb.
CARBON DISULPHIDE.—£38 to £41 per ton, according to quantity, drums extra.
CARBON TETRACHLORIDE.—£48 to £53 per ton, according to quantity, drums extra.
CHROMIUM OXIDE.—Green, 1s. 3d. per lb.
INDIA-RUBBER SUBSTITUTES.—White, 4½d. to 5d. per lb.; dark 3⅝d. to 4⅜d. per lb.
LITHOPONE.—30%, £16 15s. per ton.
SULPHUR CHLORIDE.—6d. to 8d. per lb., according to quantity.
VEGETABLE BLACK.—£35 per ton upwards; 28/30%, £15 10s. 0d.; 60%, £29, delivered buyers' premises.
ZINC SULPHIDE.—£56 per ton ex works.

Plus 5% War Charge.

Nitrogen Fertilisers

AMMONIUM SULPHATE.—The following prices have been announced for neutral quality basis 20.6% nitrogen, in 6-ton lots delivered farmer's nearest station up to June 30, 1940; September, £7 5s.; October, £7 6s. 6d.; November, £7 8s.; December, £7 9s. 6d.; January, 1940; £7 11s., February £7 12s. 6d.; March/June, £7 14s.
CALCIUM CYANAMIDE.—The following prices are for delivery in 5-ton lots, carriage paid to any railway station in Great Britain up to June 30, 1940; September £8 2s. 6d.; October £8 3s. 9d.; November £8 5s.; December, £8 6s. 3d.; January, 1940, £8 7s. 6d.; February £8 8s. 9d.; March £8 10s.; April/June, £8 11s. 3d.
NITRO-CHALK.—£7 10s. 6d. per ton up to June 30, 1940.
SODIUM NITRATE.—£8 5s. per ton for delivery up to June 30, 1940.
CONCENTRATED COMPLETE FERTILISERS.—£11 4s. to £11 13s. per ton in 6-ton lots to farmer's nearest station.
AMMONIUM PHOSPHATE FERTILISERS.—£10 19s. 6d. to £14 16s. 6d. per ton in 6-ton lots to farmer's nearest station.

Coal Tar Products

†BENZOL.—At works, crude, about 1s. 0⅜d. per gal.; 90's, 1s. 9d. to 1s. 11d.; pure, 1s. 10d. to 2s. MANCHESTER: Crude, 1s. 0½d. to 1s. 1d. per gal.; pure, 1s. 10½d. per gal.
CARBOLIC ACID.—Crystals, 9d. per lb.; Crude, 60's, 3s. to 3s. 3d. according to specification. MANCHESTER: Crystals, 8¼d. to 9d. per lb., d/d; crude, 2s. 9d. to 3s. naked, at works.
CREOSOTE.—Home trade, from 4½d. per gal., f.o.r., makers' works; exports 6d. to 6¼d. per gal., according to grade. MANCHESTER: 4d. to 5¼d.
CRESYLIC ACID.—98/100%, 2s. 6d. to 2s. 9d. per gal., according to specification. MANCHESTER: Pale, 99/100%, 2s. 10d.
NAPHTHA.—Solvent, 90/160°, 1s. 9d. to 2s. per gal.; solvent, 95/160°, 2s. to 2s. 3d., naked at works; heavy 90/190°, 1s. 6d. per gal., naked at works, according to quantity. MANCHESTER: 90/160°, 1s. 6d. to 1s. 8d. pre gal.
NAPHTHALENE.—Crude, whizzed or hot pressed, £7 to £7 10s. per ton; purified crystals, £9 per ton in 2-cwt. bags. LONDON: Fire lighter quality, £3 to £4 10s. per ton. MANCHESTER: Refined, £17.
PITCH.—Medium, soft, 36s. per ton, f.o.b. MANCHESTER: 32s. 6d. f.o.b. East Coast.
PYRIDINE.—90/140°, 17s. 6d. per gal.; 90/160°, 15s.; 90/180°, 3s. to 4s. per gal. f.o.b. MANCHESTER: 14s. to 17s. 6d. per gallon.
†TOLUOL.—90%, 2s. 4d. to 2s. 6d. per gal.; pure, 2s. 6d. to 2s. 7d. MANCHESTER: Pure, 2s. 7d. per gallon, naked.
XYLOL.—Commercial, 2s. 3d. to 2s. 6d. per gal.; pure, 2s. 9d. to 3s. MANCHESTER: 2s 6d. per gal.

Wood Distillation Products

CALCIUM ACETATE.—Brown, £7 5s. to £8 per ton; grey, £9 to £11. MANCHESTER: Grey, £14.
METHYL ACETONE.—40.50%, £35 to £38 per ton.
WOOD CREOSOTE.—Unrefined, 8d. to 1s. per gal., according to boiling range.
WOOD NAPHTHA, MISCIBLE.—3s. 3d. to 3s. 8d. per gal.; solvent, 3s. 4d. to 3s. 9d. per gal.
WOOD TAR.—£3 to £8 per ton, according to quality.

Intermediates and Dyes

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZALDEHYDE.—1s. 10d. per lb., for cwt. lots, net packages.
BENZIDINE, HCl.—2s. 7d. per lb., 100% as base, in casks.
BENZOIC ACID, 1914 B.P. (ex toluol).—1s. 11d. per lb. d/d buyer's works.
m-CRESOL 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.
o-CRESOL 30/31° C.—6½d. to 7½d. per lb. in 1-ton lots.
p-CRESOL 34/35° C.— 1s. 7d. to 1s. 8d. per lb. in ton lots.
DICHLORANILINE.—2s. 1½d. to 2s 5½d. per lb.
DIMETHYLANILINE.—Spot, 1s. 7½d. per lb., package extra.
DINITROBENZENE.—7½d. per lb.
DINITROCHLORBENZENE, SOLID.—£79 5s. per ton.
DINITROTOLUENE.—48/50° C., 8½d. per lb.; 66/68° C., 11d.
DIPHENYLAMINE.—Spot, 2s. 3d. per lb.; d/d buyer's works.
GAMMA ACID, Spot, 4s. 4½d. per lb. 100%, d/d buyer's works.
H ACID.—Spot, 2s. 7d. per lb.; 100%, d/d buyer's works.
NAPHTHIONIC ACID.—1s. 10d. per lb.
β-NAPHTHOL.—£97 per ton; flake, £94 8s. per ton.
a-NAPHTHYLAMINE.—Lumps, 1s. 1d. per lb.
β-NAPHTHYLAMINE.—Spot, 3s. per lb.; d/d buyer's works.
NEVILLE AND WINTHER'S ACID.—Spot, 3s. 3½d. per lb. 100%.
o-NITRANILINE.—4s. 3½d. per lb.
m-NITRANILINE.—Spot, 2s. 10d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 10d. to 1s. 11d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 4½d. to 5d. per lb., in 90-gal. drums, drums extra, 1-ton lots d/d buyer's works.
NITRONAPHTHALENE.—9½d. per lb.; P.G., 1s. 0½d. per lb.
SODIUM NAPHTHIONATE.—Spot, 1s. 11d. per lb.; 100% d/d buyer's works.
SULPHANILIC ACID.—Spot, 8½d. per lb. 100%, d/d buyer's works.
o-TOLUIDINE.—10½d. per lb., in 8/10 cwt. drums, drums extra.
p-TOLUIDINE.—1s. 10½d. per lb., in casks.
m-XYLIDINE ACETATE.—4s. 3d. per lb., 100%.

Latest Oil Prices

LONDON, Nov. 8.—November 25 (per ton, net, naked, ex works, mill, or refinery, subject to additions according to package): LINSEED OIL.—Raw, £36. RAPE OIL.—Crude, £44 5s. COTTONSEED OIL.—Crude, £26; washed, £28 15s.; refined edible, £29 12s. 6d.; refined deodorised, £30 10s. SOYA BEAN OIL.—Crude, £27; refined deodorised, £31. GROUNDNUT OIL.—Crude, £29 10s.; refined deodorised, £34. COCONUT OIL.—Crude, £22 2s. 6d.; refined deodorised, £25 7s. 6d. PALM OIL.—Refined deodorised, £27. PALM KERNEL OIL.—Crude, £21 10s.; refined deodorised, £24 15s. WHALE OIL.—Crude hardened, 42 deg., £24 10s.; refined hardened, 42 deg., £27. ACID OILS.—Coconut and palm kernel oils, £18 10s.; groundnut oil, £16; soya bean oil, £15. ROSIN, 25s. to 30s. per cwt., according to grade. TURPENTINE, 58s. per cwt. spot, American, including tax, ex wharf, barrels, and ex discount.

Commercial Intelligence

The following are taken from printed reports. but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

CATALIN, LTD., Waltham Abbey, chemical manufacturers. (M., 4/11/39.) October 10, debenture to Martins Bank, Ltd., securing all moneys due or to become due to the Bank; general charge. *Nil. April 18, 1939.

CECIL THOMAS, LTD., Camborne, dealers in cement and lime, etc. (M., 4/11/39.) October 20, £2,000 (not ex.) debenture to Eastwoods Lewes Cement, Ltd.; general charge.

J. E. SNOW (PLASTICS) LTD., Sheffield. (M., 4/11/39.) October 19, first debenture to Mosley Street Nominees, Ltd., securing all moneys due or to become due from the company to Williams Deacon's Bank, Ltd.; general charge. *Nil. May 26, 1938.

YORKSHIRE COKING AND CHEMICAL CO., LTD., London, S.W. (M., 4/11/39.) October 23, £32,000 mortage to United Kingdom Gas Corporation, Ltd., general charge. *Nil. October 14, 1938.

Companies Winding-Up Voluntarily

THE IRISH OCHRE AND MINERALS COMPANY (1915) LIMITED. (C.W.U.V., 4/11/39.) Henry Stentiford, of 1 Broad Street, London, E.C.2, appointed Liquidator.

Satisfactions

MINEHEAD GAS LIGHT AND COKE CO., LTD. (M.S., 4/11/39.) Satisfaction October 20, of charges registered July 6, 1923, and July 29, 1925.

County Court Judgments

CHARLES RODGERS LABORATORIES, LTD., registered office, chemist, 12 Park Parade, Harrogate. (C.C., 4/11/39.) £15 4s. 3d. September 27.

Partnerships Dissolved

CALDER AND ARMOUR, 14-16 Broomielaw, Glasgow, paint, oil and colour merchants. (P.D., 4/11/39.) August 31, by retiral of James Armour. Debts by William Armour, who continues. (October 27, 1939).

Receivers Ceasing to Act

LENNARD LABORATORIES, LTD., London, N. (R.C.T.A., 4/11/39.) J. H. G. Peterken. October 13.

Release of Liquidator

THE BARNSLEY GAS COMPANY, Barnsley, West Riding, York. (R.O.L., 4/11/39.) George Bingley Lancaster, 8 Regent Street, Barnsley, Yorks. Date of Release—October 13, 1939.

New Companies Registered

Serum Laboratories, Ltd. (357,371).—Private company. Capital, £2,000 in £1 shares. To carry on the business of manufacturers, producers and testers of sera and other biochemical, pharmaceutical and biological products and preparations, etc. Subscribers: George F. Loewi, George S. Hamilton, Dr. Julius Csonka (First director). Secretary (pro tem): George F. Loewi. Registered office: 46/7 London Wall, E.C.2.

Umbroc, Ltd.—Private company. Nominal capital £100 in 100 shares of £1 each. To adopt an agreement with the Lords Commissioners of the Admiralty, and to carry on the business of manufacturers of and dealers in plate, sheet and other glass, and articles made therefrom including bottles, manufacturers of chemical products and drugs, manufacturers and moulders of plastic materials. Directors: William H. S. Chance, Caspidge, Finstall, near Bromsgrove, Worcs.; Neville J. B. Raymond, James Meikle, Dr. Harry Moore. Solicitor: R. H. Eggar, Grove Street, St. Helens. The file number is 357,142.

Black Out Illuminations, Ltd. (357,071).—Private company. Capital £100 in 100 ordinary shares of £1 each. To carry on the business of chemists, druggists, manufacturers of and dealers in paints, varnishes, oils, pigments, dyewares, salts and acids, advertisers, advertising contractors, electricians, manufacturers of and dealers in electrical, illuminated and other advertisement signs, etc. Subscribers: Maudie Charlton, 10 Rochester Terrace, Kentish Town, N.W.1; Ivor Cripps. First directors: Hugh V. Black, Henry K. Hutchings. Solicitors: Underwood, Barrow and Heys-Jones, 9 Cavendish Square, W.1.

H. M. Gibson (Furness), Ltd. (357,279).—Private company. Capital: £2,000 in 2,000 shares of £1 each. To acquire the business of a manufacturer of charcoal and ancillary products, carried on by H. M. Gibson at or near Bouth, Lancs.; and to carry on the business of manufacturers of and dealers in charcoal, including the conversion of wood, coconut shells and vegetable matter into charcoal, manufacturers of and dealers in wood tar, wood naphha, wood creosoe, acetic acid, acetone, calcium, acetate, methyl alcohol and all other by-products of chemicals produced in the distillation or carbonisation of wood, dealers in timber and wood, sawdust, etc. Subscribers: Hubert M. Gibson, Kilnbank Cottage, Subberthwaite, Blawith, Lancs.; Cuthbert Irwin. Solicitors: W. A. Chislett & Brown, 5 Lawson Street, Barrow-in-Furness.

Chemical and Allied Stocks and Shares

UNDER the influence of the further rise in gilt-edged stocks and the good impression created by developments in international affairs, more active conditions have ruled on the Stock Exchange this week. As there was very little selling, the tendency has been for moderate demand to result in a marking up of industrial and other securities, but best prices made this week were not fully held. Where changed, debentures and preference shares have shown movements in favour of holders.

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Borax Consolidated remained a steady feature around 25s. 9d., while Fison Packard were better at 37s. although, pending publication of the results, the price was not tested adequately by business. B. Laporte were also inactive and remained around 56s. 3d., but Sanitas Trust 10s. ordinary shares at 15s. 6d. have more than held the rise which followed declaration of the interim dividend. British Industrial Plastics 2s. ordinary shares improved from 1s. 7½d. to 2s. 1½d. aided by the raising of the dividend from 6 per cent. to 8 per cent., while Erinoid were slightly better at 2s. 9d. As usual, Imperial Chemical reflected the surrounding market tendency, and were 30s. 10½d. compared with 29s. 4½d. a week ago, while the preference units were also quite active and have risen from 30s. 3d. to 30s. 9d. The current market view is that, although substantial additions will no doubt continue to be made to the reserve funds, there seems a reasonable possibility of the I.C.I. dividend being kept on an 8 per cent. basis.

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Dorman Long improved, awaiting the preliminary figures for the past year's working, while Guest Keen were better on the interim dividend, and various other iron, steel and kindred shares have also moved to better prices, including Stewarts and Lloyds. Babcock and Wilcox were steady at 40s., and Birmid Industries were 53s. 9d. pending publication of the results. Dunlop Rubber reflected the better market tendency with a rise to 28s. and General Refractories remained steady at 9s. 3d. Imperial Smelting at 11s. 9d. held their recent improvement. British Aluminium at 53s. lost an earlier improvement, as did British Oxygen at 74s. 4½d. United Molasses fluctuated moderately, but at 25s. were unchanged on balance, awaiting the results, due this month. Wall Paper deferred kept around 18s. 9d. in front of the dividend announcement, which is anticipated next week. Securities of cement manufacturers and allied concerns were relatively dull, but British Plaster Board were firm at 24s. 9d. in advance of the interim dividend decision.

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Pending declaration of the interim payment Lever and Unilever have risen to 33s., an improvement of 2s. on balance, while slightly higher prices were made by the 7 per cent. and 8 per cent. preference units. Reckitt & Sons' ordinary were 1s. better at 92s., while Cerebos £1 ordinary, whose dividend last year was 40 per cent., continued to be quoted at £8. Monsanto Chemicals 5½ per cent. preference shares held their recent improvement to 21s. 3d. and Greeff-Chemicals 5s. ordinary units continued at par.

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Elsewhere Boots Drug were firmer at 42s. 6d. as were Beechams Pills deferred at 7s. 6d. and Timothy Whites and Taylors at 20s. 3d., while Sangers were 19s. 9d. Bradford Dyers, Bleachers and various other textile shares were slightly lower, but Courtaulds and British Celanese were better on the recent decision to raise yarn prices. The British Celanese annual report falls to be issued at the end of the month or early in December.

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Contrary to the general experience, various oil shares were lower on balance. Anglo-Iranian, now "ex" the interim payment, were 60s. compared with 62s. 6d. a week ago. Burmah Oil 63s. 9d. compared with 65s. and Trinidad Leaseholds 85s. 7½d. compared with 87s. 6d. Exceptionally "Shell" have improved from 85s. 7½d. to 87s. 6d.